

**Appendix C**  
**Comments on Draft**  
**Environmental**  
**Assessment**



**Final Environmental Assessment and  
Nationwide Section 4(f) Evaluation**

## APPENDIX C—COMMENTS AND RESPONSES

Comments on the Draft Environmental Assessment and Nationwide Section 4(f)/6(f) Evaluation (January 22, 2004) were submitted to DelDOT. These comments were received during the coordination process and during the public comment period, see Chapter V. Comments were received from resource agencies and the public. Responses to each comment received are presented in this Appendix, and changes to the project resulting from these comments are reflected throughout this Final Environmental Assessment and Nationwide Section 4(f) Evaluation.

The Appendix is arranged such that comment letters received are reproduced on the left side of the page with the specific comments numbered. The corresponding responses are presented on the right side of the page. The agency comments are organized by Federal and State agencies. An index of the comments is provided (see right).

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INDIAN RIVER BRIDGE FIELD REVIEW COMMENTS  
ART SPINGARN, U.S. EPA Region III  
9-15-03

I participated in a field review of the Indian River Bridge project area with Justin Reel and Michael Schening (R,K, & K Engineers) on Aug. 18, 2003. We walked through most of the potential impact areas associated with the project, including the tidal marsh in the southwest project quadrant, the backdune community associated with the proposed U-road configuration in the south-east quadrant, and the mixed upland/wetland community associated with the southbound access road from the single point access in the northwest project quadrant.

After the field review, I discussed the project with Kevin Magerr. The following thoughts, observations, and questions are based on the field review and subsequent discussion with Kevin.

1. Impact Minimization: We believe that additional minimization of impacts may be possible. The proposed access road to the single point interchange in the northwest project quadrant runs for approximately 2,400 feet along the west side of Route 1. The current proposal shows this access road bisecting the mix of upland and wetland habitat that remains between Indian River Bay and the highway. Could this access road be shifted (east) closer to existing southbound Route 1? While the shift would impact more low quality ditched wetlands, we feel these impacts could be easily compensated. (Power lines might need to be relocated.)

2. Dune Impacts: Impacts to secondary dunes (backdunes) are of equal ecological concern as impacts to tidal marsh impacts for this project. Intact dune communities are becoming increasingly rare as they are impacted by development up and down the east coast; it is critical to protect those that remain, and where possible, to restore them.

2 We feel that any dune restoration effort should incorporate both foredune and backdune components. We recognize that dune restoration in a dynamic ocean environment is a risky undertaking (the new dunes could easily "blow out" with the next big storm.) Are there some "success stories" or "lessons learned" from other coastline highway projects that would be helpful on this project? Are there any peer-reviewed journal articles regarding successful dune restoration? What do historic aerial photographs tell us about the dynamics of this particular shoreline?

Could a dune habitat restoration effort (both foredune and backdune) be attempted along the 1,800 foot long segment of Route 1 that would likely be abandoned on the northeast side of the project? Other potential areas might include the several blowout areas visible in aerial photos of northeast project quadrant (Some recent foredune creation was observed in one of these.)

3. Diamondback Terrapins: We observed abundant evidence of Diamondback Terrapins (eggshells, nest excavations), particularly in the northwest quadrant. Any mitigation package for the Indian River Bridge Project should include measures to protect, restore, and/or enhance their habitat.

*Comment 1*  
*Response:*

The location of the park access road north of the Inlet was predicated by AASHTO criteria and the 1,100-foot offset for the deceleration of design vehicles and compensation for potentially distracted drivers. In order to minimize impacts to the open waters in Bottom Hills Drain, the intersection was moved approximately 400 feet north. The resulting, approximately 2400 linear foot access road will be constructed largely on the abandoned roadbed (earlier SR 1 alignment), which is parallel to the existing and proposed SR 1 mainline. Construction of the access road within this area, which contains remnants of the old road, will help reduce unavoidable wetland and habitat impacts.

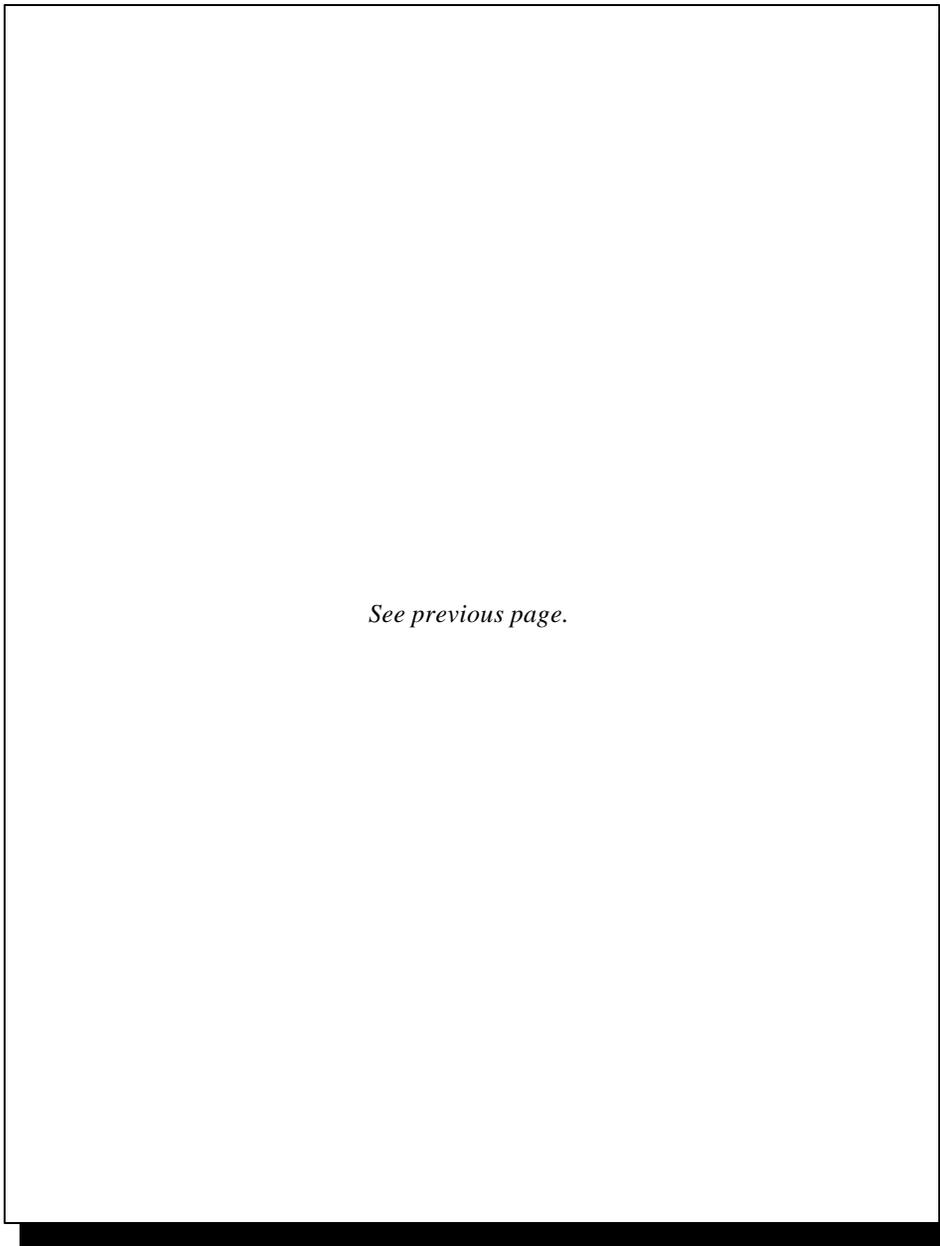
The access road was designed as close to the proposed SR 1 mainline as possible to safely provide a shoulder between the access road and SR 1 and to minimize the impacts to the wetlands and uplands in the project's northeast and northwest quadrant. The area within the park access "loop" is being utilized for stormwater management to enhance post construction water quality that runs off the proposed impervious areas. This area was chosen for stormwater quality because this area will be disturbed during construction and will require no additional wetland disturbance and only minimal additional disturbance during construction of the stable outfall for the facility.

*Comment 2*  
*Response:*

The selection of the preferred alternative for this project was predicated, in part, on the importance of the dune habitat that exists within the project area. Natural processes and shoreline development currently stress these valuable Delaware resources, thus protection of the dune ecosystem is a priority of DNREC. As such, DelDOT has conducted numerous field visits and office meetings with DNREC and other resource agencies to assure that this ecosystem and the surrounding wetland environments are respected throughout the design and construction process. The bulk of DelDOT's coordination as it relates to this resource has been and continues to be through Mr. Tony Pratt, Ms. Karen Bennett, Ms. Holly Niederriter, and Ms. Joanne Haughey of DNREC. Over the years DNREC, working closely with DelDOT, has provided direction and expertise to stabilize, protect, and restore the sensitive fore and back dune habitats both north and south of the Indian River Inlet. For this reason, DelDOT looks to DNREC as the resident expert and would ask you to query them as to "success stories," peer review journals, and historic aerials of the area as it relates to the dune ecosystem.

As to the restoration of the approximate 1,800-foot oceanfront segment in the northeast quadrant mentioned in your letter, DelDOT is committed to study this area and work with DNREC to stabilize and restore the dune ecosystem within the project area. Working to-

**Federal Agency**



**U.S. Environmental Protection Agency  
Region III**

gether with a focus on both function and stewardship, DNREC is guiding the design of the restoration effort. Additionally, DNREC and DelDOT are developing a method to protect the roadway system from periodic dune “blowouts” through the use of native vegetative screen that will act as a windbreak and disrupt the conveyance of sand onto and across SR 1. These design activities will be reflected in the project’s construction documents and described in the Final Environmental Assessment. The project’s conceptual mitigation plan accompanied the project’s joint federal/state wetland permit submission (March 12, 2004).

***Comment 3***

***Response:***

DelDOT is working closely with DNREC (Natural Heritage & Endangered Species) staff to formulate appropriate measures to protect Diamondback Terrapins from past and future impacts associated with the project. The project remains committed to taking action to protect, to the extent possible, Diamondback Terrapins and details of the proposed enhancement activities are included in Appendix B of the Final Environmental Assessment.

## Federal Agency

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4. Independent Environmental Monitor: Because of the sensitive nature of both the salt marsh habitat on the west side of the project, and the sand dune community on the east side, we feel it will be particularly important to closely monitor any land disturbance associated with construction in order to keep impacts to an absolute minimum. The Maryland State Highway Administration has a successful track record of hiring independent environmental monitors to oversee all environmental aspects on a number of their large projects. The monitor is on site throughout construction, and sees to it that wetland and limits-of-disturbance lines are properly flagged and observed, oversees the grading and planting of mitigation areas, ensures that sediment and erosion controls are functioning properly, reports on any spills or other problems, etc. We recommend that DeLDOT strongly consider hiring an independent environmental monitor for the Indian River Bridge Project.

## U.S. Environmental Protection Agency Region III

### *Comment 4*

#### *Response:*

DeLDOT will provide an environmental monitor to view the construction procedures and practices at both the mitigation sites and the mainline construction project. This monitor will be a qualified individual who is familiar with construction within sensitive environments, but also one who is familiar with the project's design and approval activities in lieu of an "independent" individual who is unfamiliar with this project.



STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES &  
ENVIRONMENTAL CONTROL  
DIVISION OF WATER RESOURCES  
89 KINGS HIGHWAY  
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WETLANDS & SUBAQUOUS  
LANDS SECTION

TELEPHONE (302) 739-4691  
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June 24, 2003

Mr. Thomas Heil  
RK&K Engineering  
2901 Eisenhower Blvd.  
Alexandria, VA 22314

RE: Indian River Inlet Bridge

Dear Mr. Heil:

I am submitting these comments in response to the information we received at the June 12, 2003 field review and meeting about the Indian River Inlet Bridge. Given the nature of the area, I am aware that this project provides challenges for design of an environmentally sensitive and safe project. Nevertheless, it appears that some impacts have not been minimized as part of the design. The following are my comments:

- 1 • The proposed access roadways to the park on the north and south sides of the bridge are both greater than 2,400 feet long. In some locations these access roadways extend 160 feet off the existing roadway. It is obvious that this construction will cause significant impacts to wetlands and dunes. The length of the roadways seems to be, at least in part, driven by the length of the acceleration lanes, which are 1500 feet long each. Is there an alternative to the construction of the long access roadways? Could the acceleration lanes be decreased in length or located on the bridge?
- 2 • The "Environmental Inventory Summary Data," dated June 3, 2003, identifies rare, threatened and endangered species habitat as being present in large portions of the dunes. Yet, the long access roadway to the south of the bridge is proposed for construction in this sensitive area. Please identify the species of environmental concern. Can this impact be minimized?
- 3 • An interdunal wetland, which is considered a unique and significant wetland habitat, will also be impacted as part of the proposed access road on the southern side of the bridge. Impacts to this wetland area and any other interdunal wetland area should be avoided.
- 4 • The proposed access road on the northern side of the bridge will also impact large amounts of wetlands and dunes. The strip of land in this area is very narrow. Could the project be minimized? Could DelDOT create dunes and wetlands in this vicinity as compensation for impacts?

*Delaware's good nature depends on you!*

**Comment 1  
Response:**

The minimum length of the access roadways is primarily dependent on the speed-change (acceleration or deceleration) lanes associated with each State Route 1 (SR 1) park access point. The length of these lanes have been determined using American Association of State Highway and Transportation Officials (AASHTO) criteria found in the Policy on Geometric Design of Highways and Streets or the "Green Book". As you are likely aware, AASHTO is the preeminent source for technical information on the design, construction, and maintenance of highways and other transportation facilities, and the Green Book is generally considered the standard for highway geometric design in the United States.

In the Green Book, AASHTO defines a speed-change lane as "an auxiliary lane, including tapered areas, primarily for the acceleration or deceleration of vehicles entering or leaving the through-traffic lanes." In Chapter 10 of the Green Book, AASHTO provides lengths of speed-change lanes and tapers for various roadway configurations, roadway slopes and speed changes.

Beyond the quantitative criteria for the length of speed-change lanes, AASHTO states that "the warrants for use of speed-change lanes cannot be stated definitively." Many factors must be considered in determining the lane location and configuration, such as speeds, traffic volumes, design vehicles, capacity, type of highway, service provided, the arrangement and frequency of intersections, surrounding environment and accident experience. Accordingly, DelDOT, considered these many factors into the roadway design. However, two factors largely determined the final access road intersection location: the design vehicle and the surrounding natural environment.

**Design Vehicle:** According to AASHTO, design vehicles are "selected motor vehicles with weight, dimensions and operating characteristics used to establish highway design controls for accommodating vehicles of designated classes." Furthermore, AASHTO states, "In the design of any highway facility, the designer should consider the largest design vehicle likely to use that facility with considerable frequency or a design vehicle with special characteristics appropriate to a particular intersection in determining the design of such critical features as radii at intersections and the radii of turning roadways." The Access Roads, located north and south of the inlet, service multiple areas, such as campgrounds that are predominately equipped for motor homes, a marina, day-use recreational facilities and a residential community. It was determined that the largest design vehicle likely to use these facilities with considerable frequency was a motor home towing a boat trailer (AASHTO designation MH/B). Primary considerations associated with the design of roadways with this design vehicle are the stopping distance and turning radius.

*See previous page.*

**Surrounding Natural Environment:** From a road design perspective, the project’s surrounding natural environment is perhaps best described as visually distracting with wide expansive views and compelling scenery. Additionally, the construction of the new and unique inlet bridge that is proposed for this site will only add to the visual distractions. AASHTO states that “drivers can only attend to one visual information source at a time,” and further states that “drivers sample visual information obtained in short duration glances, shifting their attention from one source to another.” The net effect of scenic or otherwise diverting surroundings is a driver who is, at times, distracted and may require additional roadway features to augment safety. An example of these features are rumble strips prior to a toll booth, which help redirect attention from finding spare change to slowing and selection of a booth.

The primary result of the application of AASHTO criteria and the interpretation of site specific conditions is the separation of deceleration lanes off the bridge structure and on slopes of no greater than 2%. This design feature helps ensure that the key design vehicle (motor home with boat trailer or MH/B) has adequate stopping and queuing distance, and that potentially distracted drivers have adequate distances to refocus attention to slowing and merging onto the auxiliary lanes. This criteria directly effects the location of the access roads in the northwest and southwest quadrants of the project

Review of the bridge and roadway profile indicates slopes of 2% and less begin approximately 1100 feet from the near bridge abutment. With that consideration, review of the South Park Access, U-Roads Access Concept diagram shows the deceleration lane in the southwest quadrant begins at this 1100-foot breakpoint and extends approximately 530 feet, as per AASHTO criteria, to the access road intersection. In the northwest quadrant, however, application of the criteria would require the construction of the “bulb-intersection” in wetland and open water portions of Bottom Hills Drain. Therefore, the intersection was moved and the associated lanes were relocated approximately 400 feet further north to avoid excessive impact as seen in the North Park Access, Single Point Access with Partial Signal diagram.

As the access roads in the northwest and southwest quadrants were located based upon criteria for the deceleration lanes, the access road intersection in the southeast quadrant is located based upon the northbound acceleration lane. As previously discussed, the length of this lane is dictated by AASHTO criteria and similarly adjusted to meet project specific conditions. As can be seen by review of the South Park Access, U-Roads Access Concept diagram, the acceleration lane extends 1500 feet from the intersection to terminate at the bridge structure. Although the placement of this acceleration lane on the structure is not specifically precluded by AASHTO criteria, intersection configurations would likely result in the differential placement of additional lanes on the decking. As the deck is suspended

*See previous page.*

to achieve the large span length, differential, or unbalanced, loads on that deck are prohibited due to design and cost constraints.

In summary, the access roads and associated speed-change lanes are located based upon AASHTO criteria and interpretation of site specific conditions, in order to ensure the safe and efficient movement of vehicles through a particularly complex area. The maximization of safety, however, does not mean the wholesale and indiscriminate impact of environmental resources. The project is focused on improving safety while balancing potential affects on the environment. Avoidance and minimization efforts, such as reduced lane widths, turning radii, and retaining walls, have been incorporated to minimize unavoidable natural resource impacts.

***Comment 2***

***Response:***

Coordination with the U.S. Fish and Wildlife Service and DNREC- Natural Heritage (Refer to November 13, 2003 letter) have indicated species identified as potentially occurring within the project study area. Refer to Section IV.B.8 in the Final Environmental Assessment.

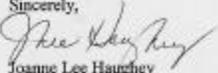
The location of the intersections and associated access roads and speed-change lanes are dictated by the criteria discussed in the response to Comment 1. In review of that criteria, the location of the U-Road in the southeast quadrant is dictated by the northbound acceleration lane. The acceleration lane is determined as per AASHTO criteria and terminates at the bridge due to structural loading concerns. The location of the Single Point Access in the southeast quadrant is dictated by the southbound deceleration lane and queuing for the left turning vehicles. Again, this lane was sized as per AASHTO criteria and is separated approximately 1100 feet from the structure to provide adequate slowing and merging distance for the design vehicle. This deceleration lane causes the Single Point Access to be located approximately 500 feet farther from the bridge than the U-Road Access alternative, resulting in the 2.2 acres in additional upland habitat.

The Project has conducted a thorough analysis of the possible alternatives for the replacement bridge and park access. (Refer to Section III of the Final Environmental Assessment.) As discussed above, the result of this analysis for park access in the southeast quadrant was the preference for the U-Road access as the selected alternative. This alternative will impact approximately 2.2 acres less upland habitat in that area than the other feasible configuration (Single Point) and maximizes safety by eliminating cross traffic. Agreement on this justification by DNREC is reflected by the acceptance of the preferred alternative through concurrence of Alternatives Analysis Document on February 11, 2004.

***Comment 3***

Thank you for this opportunity to comment. If you have any questions, please contact me at (302) 739-4691.

Sincerely,



Joanne Lee Haughey  
Wetlands & Subaqueous  
Lands Section

cc: Terry Fulmer, DelDOT  
cc: Joy Ford, DelDOT

**Response:**

The interdunal wetland area located in the project's southeastern quadrant would have been impacted by the Single Point Park Access alternative. However, DelDOT's selected park access road, U-Road Concept, alternative avoids impacts to this wetland area.

**Comment 4**

**Response:**

As discussed in the response to Comment 1, the location of the park access road north of the inlet was predicated by AASHTO criteria and the 1100-foot offset for the deceleration of design vehicles and compensation for potentially distracted drivers. In addition, in order to minimize impacts to the open waters in Bottom Hills Drain, the intersection was moved approximately 400 feet further north. The resulting 2400± foot access road will be constructed largely on the abandoned roadbed parallel to the SR 1 mainline. Construction on this elevated/semi-paved area should help reduce unavoidable wetland and habitat impacts.

Since the development of the alternatives retained for detailed study in June 2003, further avoidance and minimization measures have been studied and implemented. See discussion in Section III.C5. It should also be noted that the initial preferred alternative for park access north of the inlet was the construction of a U-Road, similar to that proposed to the south. This alternative was, however, dropped because of extensive impacts to the dune system in the northeast quadrant.

With regards to mitigation, the Project has coordinated with DNREC, the ACOE, and supporting agencies for mitigation of any unavoidable impact. Please refer to Appendix B—Compensatory Mitigation Plan of the Final Environmental Assessment for specific details associates with the mitigation package for this project.

Original Message -----

**From:** Niederriter Holly (DNREC)

**To:** Fulmer Terry (DelDOT) ; Haughey Joanne L. (DNREC) ; mSchening@rkkengineers.com ; jreel@rkkengineers.com ; theil@rkkengineers.com ; Edward.E.Bonner@usace.army.mil ; jmadaras@rkkengineers.com

**Cc:** Bennett Karen (DNREC)

**Sent:** Friday, October 10, 2003 4:02 PM

**Subject:** IRI Bridge Functional Assessment comments

I have a few comments regarding yesterday's meeting, the Functional Assessment, RK&K responses to Joanne's comments, and the Alternative Development Document.

First, I wanted to let everyone know that the Delaware Natural Heritage and Endangered Species Program will not require nesting bird surveys that could disrupt the schedule for bridge planning. Although I did suggest that surveys be conducted in an email I sent on July 14, data we already have will be sufficient to comment on bird species likely to nest in affected areas. Karen Bennett will be sending our formal comments soon.

1 I read through Joanne's comments and RK&K's response. Joanne asked about the possibility of decreasing the length of the acceleration lanes or putting part of them on the bridge. In the reply, Tom Heil cited criteria for determining length of speed change lanes. The factors included traffic speed and volumes, capacity, type of highway, etc. Most of the factors listed are beyond our control, but there has been some discussion at meetings about decreasing the speed limit in the area of the bridge. Can you provide information on how decreasing the speed limit could decrease the length of the acceleration lanes?

2 I was also looking through past documentation to see what effect the length of the span could have on required length of acceleration lanes, but did not see any information. Would it be possible to provide information on differences in habitat impacts between the two different span lengths? Also, if the span is decreased, would the height also need to be reduced in order to make a difference in amount of habitat impacted?

Functional Assessment:

1) I agree with Joanne that having the LOD's overlaid on the maps would be helpful. It might also be helpful to Joanne and others if the "species of concern" shape file were included on the maps.

2) Analysis Unit No. 16 (Map 3 in SE quadrant): Piping plovers are mentioned as potential nesters. I don't think this area would support piping plovers (unless a storm leveled the dune and removed the vegetation). Piping plovers and least terns use large, open sand areas to nest. There are potential areas on the ocean side of the dunes and in the back dune areas north of the inlet. However, American

**Comment 1**

**Response:**

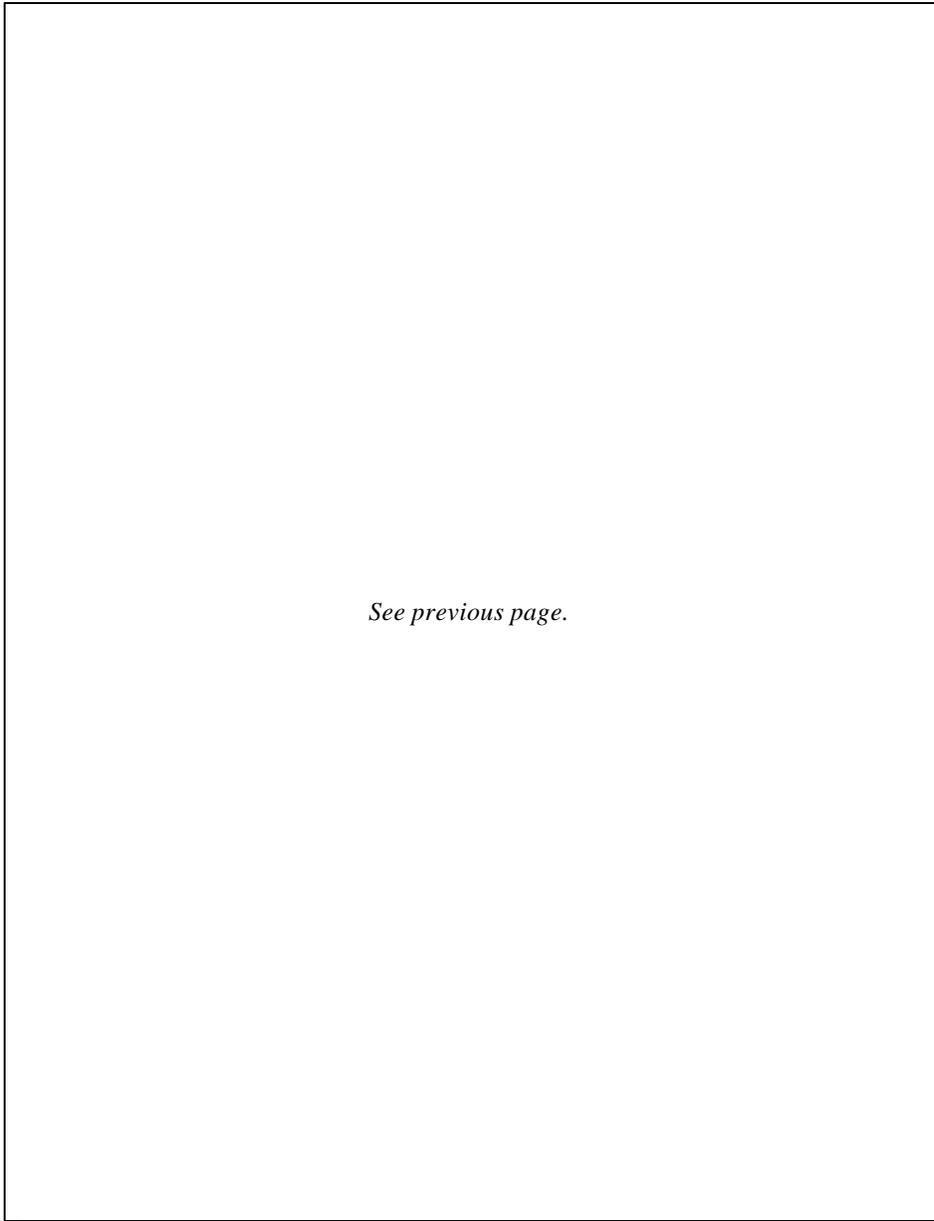
AASHTO criteria states that the design speed is "a selected speed used to determine the various geometric design features of the roadway," and recommends a 70 mph design speed for arterial highways in rural areas such as SR1 within the project area. You may recall discussions during the July 21, 2003, agency coordination meeting during which DelDOT considered reducing the design speed. This consideration was based on the potential reduction of habitat and wetland impacts associated with roadway geometric variations as design speeds were reduced. Accordingly, DelDOT selected the 60 mph design speed in order to avoid and minimize resource impacts, although AASHTO clearly recommended a 70 mph design speed for SR 1 within the project area. Although a further reduction in design speed would result in reduced impacts, DelDOT cannot consider reducing the design speed below 60 mph because it will compromise the safety of the roadway by affecting the capacity to safely convey vehicles, especially those vehicles exceeding posted limits. Accordingly, the project is currently being designed with a 60 mph design speed and the facility will be posted for a maximum running, or actual, speed of 55 mph.

Experience has shown that regardless of signage and enforcement, vehicles are very likely to exceed the posted speed limit (55 mph), specifically through the project area. This is especially true in an area that is bounded by higher posted speeds north and south with long stretches of open roadway. The following statements are excerpted from AASHTO criteria and address clarify the criteria selected for this project:

- "The selected design speed should be consistent with the speeds that drivers are likely to expect on a given highway facility. Where a reason for limiting speed is obvious, drivers are more apt to accept lower speed operation than where there is no apparent reason...A low design speed, however, should not be selected where the topography is such that drivers are likely to travel at high speeds. Drivers do not adjust their speeds to the importance of the highways, but to their perception of the physical limitations of the highway and its traffic", and
- "Speed zones cannot be made to operate properly if the posted speed limit is determined arbitrarily. In addition, speed zones should be determined from traffic engineering studies, should be consistent with the prevailing conditions along the street and with the cross section of the street, and should be capable of reasonable enforcement."

Since it is likely that vehicles will exceed the posted speed limit, DelDOT, for safety reasons, is obligated to design the roadway for a 60 mph design speed regardless of the

**Department of Natural Resources & Environmental Control  
Division of Fish & Wildlife  
Natural Heritage & Endangered Species**



*See previous page.*

posted limit. Since design speed governs roadway geometric design, a decrease in the posted speed limit will have no effect on the length of acceleration lanes and thus on the unavoidable resource impacts.

***Comment 2***

***Response:***

The bridge span length and navigational clearance height have a direct relationship to the habitat and wetland impacts south of the inlet. North of the inlet, the intersection and associated auxiliary roadways are located as to minimize resource impacts and are not dependent on span length or navigational clearance.

With specific regard to span length, the 1000-foot span was chosen to accommodate potential future widening of the inlet to dimensions found west of the bridge. An 800-foot span, which would not accommodate future inlet widening, was also considered. The implementation of the shorter span would allow the intersection in the southeast quadrant to be in closer proximity to the structure, and the adjustment would only yield approximately 0.1 acres of resource impact reductions.

Any combination of the span lengths and navigational clearances studied for this project is feasible (i.e. 800-foot span with 35-foot clearance, 1000-foot span with 35-foot clearance, etc.). However, regardless of the span length, the level of environmental impact is determined by the clearance. A summary impact table was provided at the July 21, 2003, agency coordination meeting for navigational clearances of 35 and 45 feet. The table indicates a difference of 0.6 acres (0.2 acre wetland and 0.4 acre upland) of resource impacts occurring south of the inlet between the two options considered. Because of the minimal difference in wetland impact, safety to mariners during and after construction, and input from the U.S. Coast Guard; the resource agency representatives accepted the 45-foot bridge clearance with a 1,000-foot bridge span option at the July 21, 2003, agency coordination meeting.

3 | 3) I would like to see references cited for facts (such as those on page 8 concerning rare and endangered species and communities).

4 | 4) Analysis Unit No. 20: Notes include that area is "heavily foraged by shore birds". Were they seen there during field work? If so, do you recall what species were seen? Shorebirds are likely to forage along sandy beaches and mud flats, so they probably use most of the area along Bottom Hills Drain and Haven Road. I've also seen them forage along and in ditches. Herons and egrets probably forage in these areas as well.

Thank you for the opportunity to review and comment on plans and documents.

Sincerely,

Holly Niederriter  
Nongame and Endangered Species Biologist  
DNREC Division of Fish and Wildlife  
4876 Hay Point Landing Road  
Smyrna, DE 19977  
302-653-2880 ext 122  
holly.niederriter@state.de.us

**Comment 3**

**Response:**

References for citations will be sent under a separate cover.

**Comment 4**

**Response:**

This comment was addressed in an email dated October 10, 2004 to the Functional Assessment working group.

WETLANDS & SUBAQUEOUS  
LANDS SECTION

TELEPHONE (302) 739-4691  
FACSIMILE (302) 739-6304

November 10, 2003

Mr. Thomas Heil  
RK&K, LLP  
81 Mosher Street  
Baltimore, Maryland 21217-4250

Re: Indian River Inlet Bridge Alternative Document

Dear Mr. Heil:

I appreciate your response to my previous comments concerning the proposed impacts associated with the roadways north and south of the Indian River Inlet Bridge. However, after reading your response, I still have concerns about the impacts to the dune and wetland systems and questions about the designs. I would appreciate your review and response to my comments.

Deceleration Lanes

1 | I question that the deceleration lanes cannot be placed on anything other than slopes of less than 2%. Because of this requirement, the deceleration lane on the south side of the bridge for access into the park cannot begin until 1100 feet off the bridge abutment and therefore 1,650 linear feet of roadway is being constructed to accommodate a 530 foot long deceleration lane.

2 | On the north side of the bridge, an approximately 3,000 foot long roadway is being constructed where a 1,000 foot roadway was previously sufficient to provide deceleration for access to the park. While the 3,000 foot road is linked to the landscape near bottom hills, if the roadway could be shortened, it would result in significantly decreased impacts.

3 | Undoubtedly, there are many places in the nation that do not have slopes of less than 2% and I suspect AASHTO has designs that facilitate deceleration lanes in these places. Has DelDOT evaluated the required length of a deceleration lane with a steeper slope? Are there other methods that would minimize the roadway impacts?

**Comment 1**

**Response:**

The decision to separate the deceleration lanes off the bridge structure on slopes no greater than 2% was based on the application of AASHTO design criteria. By setting the deceleration lanes off 2% slopes of the bridge, it ensures that the key design vehicle (motor home with boat trailer or MH/B) have adequate stopping and queuing distance, and that potentially distracted drivers have adequate distances to refocus attention to slowing or merging traffic.

**Comment 2**

**Response:**

In the northwest quadrant an approximately 2400 linear foot access road will be constructed largely on abandoned roadbed (earlier SR 1 alignment), which is parallel to the existing and proposed SR1 mainline. The location of this access road was dictated by AASHTO criteria and the 1,100-foot offset needed for the deceleration of the design vehicles and to compensate for potentially distracted drivers. Construction of the access road within this area, which contains remnants of the old road, will help reduce unavoidable wetlands and habitat impacts.

The access road was designed as close to the proposed SR 1 mainline as possible to safely provide a shoulder between the access road and SR 1 and to minimize the impacts to the wetlands and uplands in the northeast quadrant. The area within the park access "loop" is being utilized for stormwater management to enhance post construction water quality that runs off the proposed impervious areas. The area within the access road loop was chosen for stormwater management because this site will be disturbed during construction and will require no additional wetland disturbance during its construction and only minimal additional disturbance during construction of the stable outfall for the facility.

**Comment 3**

**Response:**

There is a direct correlation between the grade of the slope and the length of deceleration lane. The steeper the grade of the slope the greater the deceleration lane required.

November 10, 2003  
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Acceleration Lanes

Based on the information you supplied in the Draft Alternatives Development Plan, it appears that the acceleration lanes are to be 1,500 feet long. The existing acceleration lanes are 900 feet in the southwest quadrant and 1000 in the northwest quadrant. Based on the information supplied, it does not appear that the existing acceleration lengths cause safety hazards. Can you explain how the 1500 foot length was chosen?

4 Although the acceleration lane was chosen to be 1500 feet, the park access road in the southeast quadrant is to be constructed 1800 feet south of the bridge, presumably to allow for acceleration. Can this length be decreased? You indicated that the placement of the acceleration lane on the structure is not precluded by AASHTO requirements, but would “likely” result in the differential placement of lanes on the bridge structure. Has this been evaluated?

5 The park access roadway in the northwest quadrant is located 3,000 feet north of the bridge. Apparently this length is associated with the deceleration lane requirements, which I commented on in the preceding section.

Thank you for the opportunity to comment on this matter. I appreciate and support DelDOT’s commitment to safety. At the same time, this roadway is impacting important and depleted habitats and I believe that it is vital that these impacts be reviewed diligently.

Sincerely,

Joanne Lee Haughey  
Environmental Scientist  
Wetlands and Subaqueous  
Lands Section

*Comment 4*

*Response:*

The location of the access road intersection south of the inlet was based on the required length needed for acceleration of the design vehicle. The acceleration lane extends 1,500 feet (1,200 with a 300-foot taper) ending at the bridge structure. The acceleration ends before the bridge to avoid having any of the taper lane on the structure which could result in unbalanced or differential loads. As the deck is suspended to achieve the long span length, differential loads on the deck are prohibited due to design and cost constraints.

*Comment 5*

*Response:*

As stated previously in Comment 1, the location of the park access road north of the inlet and the length of the deceleration lane were determined based on AASHTO criteria and site specific conditions.

No comments on this page.



STATE OF DELAWARE  
 DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL  
 DIVISION OF FISH & WILDLIFE  
 NATURAL HERITAGE & ENDANGERED SPECIES  
 4876 HAY POINT LANDING ROAD  
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13 November 2003

Thomas M. Heil  
 Associate  
 Rummel, Klepper & Kahl, LLP  
 81 Mosher Street  
 Baltimore, MD 21217-4250

RECEIVED

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RUMMEL, KLEPPER & KAHL, LLP

RE: Indian River Inlet Bridge Draft Alternatives  
 9 October 2003

Dear Mr. Heil;

Thank you for contacting the Natural Heritage and Endangered Species program about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

A review of our database indicates that the following species and natural communities are found at or in close proximity to the Limit of Disturbance for this project:

Scientific Name	Common Name	Taxon	State Rank	State Status	Global Rank	Federal Status
<i>Andropogon furcatus</i> / <i>Panicum americanum</i> var. <i>americanum</i>	Woolly Switch-grass / Bitter Panic grass Dwarf-shrubland	Community	S2		G2	
<i>Spartina patens</i> - <i>Schroepfiesteria peruviana</i> - <i>Solidago sempervirens</i>	Overwash Dune Grassland - Saltmeadow Cordgrass - Common Threesquare - Seaside Goldenrod - Miscellaneous Vegetation	Community	S2S3		G2G3	
<i>Myrica pensylvanica</i> - ( <i>Proxys maritima</i> )	Nonlawn Sphagnum - (Swarf Plum) Shrubland	Community	S2S3		G2	
<i>Chordeiles minor</i>	Common Nighthawk	Bird	S2		G1	
<i>Charadrius melanotos</i>	Piping Plover	Bird	S1	E	G3	LT
<i>Naucorophus pallidus</i>	American Oystercatcher	Bird	S1	E	G3	
<i>Aythya americana</i>	Black Scaup	Bird	S1	E		
<i>Sitta pusilla</i>	Brown-headed Nuthatch	Bird	S1	E	G4	
<i>Sterna caerulea</i>	Least Tern	Bird	S1	E	G4	
<i>Sterna fuscata</i>	Common Tern	Bird	S1	E	G3	

13 November 2003

Indian River Inlet Bridge Draft Alternatives Comments

Natural Heritage & Endangered Species  
 DE Division of Fish and Wildlife, DNR&EC  
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*Delaware's Great Natural Heritage Depends on You!*

Scientific Name	Common Name	Taxon	State Rank	State Status	Global Rank	Federal Status
<i>Malaclemys terrapin terrapin</i>	Diamondback terrapin	Reptile	SU		G4T4	
<i>Cicindela lepida</i>	Little white tiger beetle	Insect	S1	E	G4	
<i>Cicindela marginata</i>	A tiger beetle	Insect	S1		G5	
<i>Photuris bethaniensis</i>	Bethany firefly	Insect	S1	E	G1?	
<i>Amaranthus pumilus</i>	Seabeach amaranth	Plant	S1		G2	LT

**State Rank:** S1 - extremely rare within the state (typically 5 or fewer occurrences); S2 - very rare within the state (6 to 20 occurrences); B - Breeding; N - Nonbreeding; **State Status:** E - endangered, i.e. designated by the Delaware Division of Fish and Wildlife as seriously threatened with extinction in the state; **Global Rank:** G1 - imperiled globally because of extreme rarity (5 or fewer occurrences worldwide); G2 - imperiled globally because of great rarity (6 to 20 occurrences); G3 - either very rare and local throughout its range (21 to 100 occurrences) or found only locally in a restricted range; G4 - apparently secure globally but uncommon in parts of its range; G5 - secure on a global basis but may be uncommon locally; T - variety or subspecies rank; Q - questionable taxonomy; **Federal Status:** LE - endangered, i.e. designated by the U.S. Fish and Wildlife Service as being in danger of extinction throughout its range; LT - threatened, i.e. designated by USFWS as being likely to become endangered in the foreseeable future throughout all or a significant portion of its range; PS - proposed status.

**Descriptions of natural communities:**

The following natural communities of conservation concern are found within or adjacent to the Limit of Disturbance; descriptions are from Bowman (2000)<sup>1</sup> and are general in scope and not specific to the study area for the Indian River Inlet bridge. Additional natural communities of conservation concern may be present in areas adjacent to the Limit of Disturbance, however, we have not conducted systematic surveys of Delaware Seashore State Park and adjacent properties. Natural communities in potential dune restoration areas should be evaluated by Pete Bowman, Natural Heritage Ecologist, prior to the start of any restoration work, preferably during the planning stages.

- *Eudocima tomentosa* / *Panicum amarum* var. *amarum*: Dwarf-shrubland  
 Woolly Beach-heather / Bitter Panic grass Dwarf-shrubland.

**Description:** This association is a maritime beach heather community of Atlantic coast sand dunes. The unstable substrate is influenced by wind-deposited sand and supports no soil development; large patches of sparsely vegetated or unvegetated sand are common. The community is characterized by *Eudocima tomentosa* occurring as discrete patches that may coalesce into a dense mat on older, more stabilized dunes. A number of other shrubs such as *Myrica pensylvanica*, *Myrica cerifera*, *Pinus rigida* saplings, and *Prunus maritima* may occur but are low in abundance and cover. *Schizanthus scoparium* ssp. *litorea*, *Ammophila breviligulata*, *Spartina patens*, and *Panicum amarum* var. *amarum* are common grasses of this community, and *Toxicodendron radicans* is a common vine. Other herbaceous associates include *Leucaena maritima*, *Nyctarhia polygonifolia*, *Gnaphalium obtusifolium*, *Helianthemum canadense*, *Solidago sempervirens*, and *Drosera rot.*

- **Overwash Dune Grassland**  
*Spartina patens* - *Schoenoplectus pungens* - *Solidago sempervirens*: Herbaceous Vegetation  
 Saltmeadow Cordgrass - Common Threesquare - Seaside Goldenrod: Herbaceous Vegetation

<sup>1</sup> Bowman, P.J. 2000. The natural communities of Delaware. Delaware Division of Fish and Wildlife, Department of Natural Resources and Environmental Control, Dover, DE. 73 pp.

**Comment 1**

**Response:**

DelDOT consulted with Pete Bowman, Natural Heritage Ecologist, regarding the design of the dune restoration.

**Comment 2**

**Response:**

This community of conservation concern occurs at two locations within the project limit of construction (LOC). The Woolly Beach Heather Dwarf Shrubland is present on the narrow strip of upland habitat located between SR 1 and Bottom Hills Drain north and west of the Indian River Inlet (northwest quadrant of the project). This community is also located and interspersed with other vegetation communities in the back dunes south of the inlet and east of SR 1 (southeast quadrant of the project).

Impacts to this community are unavoidable in the northwest quadrant of the project. DelDOT efforts to protect beach and foredune habitat east of SR 1 necessitated the construction of a single point access road west of SR 1. The length of the access roadway, and therefore the extent of environmental impacts, was determined by balancing traffic and safety issues with potential affects to the natural resources. In the southeast quadrant of the project, impacts to this community were minimized by balancing impacts to this and other backdune habitat east of SR 1 with impacts to tidal wetlands west of SR 1. Mitigation efforts to compensate for impacted wetlands will be carried out in close proximity to the project area as detailed in Appendix B in the Final Environmental Assessment.

**Comment 3**

**Response:**

This community is located in the northeast quadrant of the study area, on the eastern side of SR1. It is separated from the existing roadway by a 20 foot wide band of mixed-species vegetation and in some locations by a roadside ditch.

All efforts were made to avoid impacts to the northeast quadrant of the project where this community is located. The selected alternative does not directly impact this community of conservation concern. Any anticipated encroachment on the overwash dune grassland community will result from the planting of vegetation designed to screen the roadway from blowing sand. This planting screen will consist of a narrow band of native grasses, forbs and shrubs appropriate to the local ecosystem.

3 (cont.)	<p><b>Description:</b> This community is an upland dune grassland of mid-Atlantic barrier islands. <i>Spartina patens</i>, and sometimes <i>Schoenoplectus pungens</i>, or both are dominant on dunes or overwash terraces. Total vegetation cover is variable, ranging from quite sparse (25 percent cover) to dense. Bare sand is often visible through the vegetation, and there is no soil profile development. Species diversity is variable; although it may be quite low and confined to the nominal species in the northern part of the range, it may be of greater diversity, including <i>Strophostyles helvula</i>, <i>Solidago sempervirens</i>, <i>Cenchrus tribuloides</i>, <i>Setaria parviflora</i>, <i>Distichlis spicata</i>, <i>Sabatia stellaris</i>, <i>Ammophila breviligulata</i>, <i>Suaeda linearis</i>, <i>Spergularia salina</i>, <i>Atriplex prostrata</i>, <i>Euphorbia polygonifolia</i>, <i>Fimbristylis castanea</i>, and <i>Cakile edentula</i> ssp. <i>edentula</i>. The plants of this community are influenced by sand deposited by storm surges. Storm overwash is a prevalent natural disturbance to this community. This community may be a successional step between interdunal herbaceous wetlands and interdunal herbaceous/shrub uplands.</p>
4	<p>♦ <b>Bayberry – Beach Plum Maritime Shrubland</b>  <i>Myrica pensylvanica</i> – (<i>Prunus maritima</i>) Shrubland                  Northern Bayberry – (Beach Plum) Shrubland</p> <p><b>Description:</b> This community is a maritime shrubland dominated by <i>Myrica pensylvanica</i>. <i>Prunus maritima</i> may be absent from specific examples, but when it is present it often has a large coverage. Other woody plants occurring in this community include <i>Baccharis halimifolia</i>, <i>Rhus copallinum</i>, <i>Sassafras albidum</i>, <i>Toxicodendron radicans</i>, <i>Smilax rotundifolia</i>, and <i>Parthenocissus quinquefolia</i>. The constant movement of sand in this community limits the herbaceous cover. Typical herbaceous species include <i>Ammophila breviligulata</i>, <i>Cakile edentula</i>, <i>Cenchrus tribuloides</i>, <i>Chamaesyce polygonaifolia</i>, <i>Cyperus grayi</i>, <i>Diocarphaedon acuminatum</i>, <i>Dioclis teres</i>, <i>Hedyscra turanensis</i>, <i>Lactuca maritima</i>, <i>Oenothera humifusa</i>, <i>Panicum acutum</i> var. <i>acuminatum</i>, <i>Polygonella articulata</i>, <i>Rhus copallifolia</i>, <i>Solidago sempervirens</i>, <i>Spartina patens</i>, and <i>Triplaris purpurea</i>. This maritime shrubland usually occupies the intermediate areas between the very unstable overwash portions of the dunes and the more protected backdunes, where it forms partially open to dense shrub thickets. The substrate is sand with no soil profile development, and with variable amounts of accumulated leaf litter. Where this community occupies the lee side of backdunes, greater exposure to wind and storms contributes to a sparser structure and more open aspect of the vegetation. Here there are large patches of open unvegetated or sparsely vegetated sand.</p>
5	<p><u>Commons and rare species:</u></p> <p>1. <b>Common Nighthawk (<i>Chordeiles virens</i>)</b> – Although there are documented nesting occurrences for the Common Nighthawk in the Nantuxoke area and at one site in New Castle County, its primary nesting habitat in Delaware is located along the coastal dunes from Prime Hook to Fenwick Island, including Delaware Seashore State Park (DSSP). This species nests on sandy soils in open habitats between 1 May and 15 August. At DSSP, upland sparsely vegetated dunes along Route 1 serve as nesting habitat for this species. Threats to nighthawk include predation, disturbance and habitat loss. "Though much of this species' habitat in Delaware is on publicly owned land, habitat loss within these areas continues to be a concern. Fragmentation of dune habitat by infrastructure</p>

**Comment 4**

**Response:**

The maritime shrubland habitat of conservation concern is located in the southeast quadrant of the study area where it is interspersed with the beach heather dwarf shrubland, scattered individuals of the invasive Japanese black pine and areas of open sand.

Impacts to this community in the southeast quadrant of the project were minimized by balancing impacts to this and other backdune habitat east of SR 1 with impacts to tidal wetlands west of SR 1. Dune restoration efforts north of the inlet, and the associated landscape planting composed of maritime shrubland species will compensate for some of the habitat value lost to impacts.

**Comment 5**

**Response:**

This species potentially nests in any of the upland areas within the project LOC, such as the beach heather dwarf shrubland in the northwest quadrant of the study area and the interspersed dwarf shrubland and maritime shrubland locate in the southeastern quadrant. As noted in the discussions of those two natural communities of conservation concern, every effort has been made to minimize impacts to those habitats and thus to potential nighthawk nesting areas. Total avoidance of impacts to these habitats is impossible while maintaining AASHTO safety and engineering criteria. The selected alternative will minimize and balance impacts to uplands and wetlands south of the inlet. Impacts to potential habitat in the northwest quadrant of the project are unavoidable without disturbing large areas of the back dunes and overwash grasslands in the northeastern quadrant.

5 ↑

(cont.)

development places nesting areas closer to human disturbance and predation. This species is protected by the federal Migratory Bird Treaty Act.

2. **Piping Plover (*Charadrius melodus*)** – The Piping Plover is protected under the Federal Endangered Species Act (ESA) as Threatened, and is recognized as a species of highest priority by the Northern Atlantic Shorebird Habitat Working Group<sup>2</sup>. Plovers nest on broad, flat open beach and dune-blowout areas with little to no vegetation from 30 March to 31 August inclusive. Brood-rearing habitats include mud and / or sand flats with low-energy waves, but chicks may also feed at the surf's edge on oceanside beaches. These nesting and brood-rearing habitats, along with protection from human disturbance and predators, are critical for nest success. Severe storms can change the quality of beach-dune habitat for plovers greatly from year to year, altering the suitability of habitat anywhere within park at any time. Therefore, it is difficult to predict far in advance where the best habitat will be each year. Our program conducts surveys annually for beach-nesting birds throughout the spring and summer. If territorial Piping Plovers are discovered within the limit of disturbance, proposed work may be placed under a time-of-year restriction (30 March – 31 August inclusive).

Sites at Cape Henlopen State Park (i.e., Point and Gordons Pond) provide good examples of nesting habitat in Delaware. However, DSSP also has had nesting plovers on both the north and south side of the inlet over last 20 years. Though areas south of the inlet are not currently suitable for plovers, there are areas north of the inlet where marginal habitat could presently support nesting plovers, particularly if habitat conditions are further improved by wind and wave action. Within the last two years, there was a nesting pair of plovers north of the inlet between Keybox Rd. and Tower Rd.

Although we recognize dune stabilization may be necessary to protect the highway, if feasible we request that stabilization be restricted to areas immediately adjacent to the roadway. Dune blowout areas should not be altered through stabilization efforts, further discussion regarding the many habitat benefits of dune blowout areas are summarized below. In addition to protection under the ESA, this species is protected by the federal Migratory Bird Treaty Act.

3. **American Oystercatcher (*Haematopus palliatus*)** – Like the Piping Plover, the American Oystercatcher is a species of highest regional conservation concern (U.S. Shorebird Conservation Plan, North Atlantic Regional Shorebird Plan; Clark and Niles 2000)<sup>3</sup>. American Oystercatchers nest on sandy beach-dune areas that are sparsely vegetated, and also on marsh islands; nesting may occur between 15 April – 31 August. A few pairs attempt to nest each year at DSSP, but no successful nest attempts have been documented in recent years. Oystercatchers feed on bivalves, particularly mussels and

6 ↓

**Comment 6**

**Response:**

All five species discussed utilize beach front habitat for nesting. Some of these species may also nest in overwash areas. The Piping Plover and American Oystercatcher forage along the beachfront and on intertidal flats. The tern species and the Black Skimmer hunt for fish over open waters. Any of these species could potentially nest on the overwash dune grassland community in the northeast quadrant of the project. DeIDOT has made every effort to avoid impacting this area. The only area near the beach front that will be impacted by this project is the dune restoration area immediately north of the inlet. This area is subject to large-scale erosion during storms and heavy utilization by beachgoers. It is unlikely that any of this area is utilized as nesting habitat by these bird species due to the frequent disturbance. For similar reasons, it is also unlikely that any of these species will nest in close proximity to SR 1 on the overwash dune grassland areas, thus the proposed planting of a 20 foot wide screen of vegetation along the east side of SR 1 should not impact potential nesting habitat.

<sup>2</sup> Clark, K.B. and L.J. Niles. 2000. U.S. Shorebird Conservation Plan: North Atlantic Regional Shorebird Plan. U.S. Fish and Wildlife Service, Washington, D.C. 26 pp.

<sup>3</sup> Clark, K.B. and L.J. Niles. 2000. U.S. Shorebird Conservation Plan: North Atlantic Regional Shorebird Plan. U.S. Fish and Wildlife Service, Washington, D.C. 26 pp.

See response to Comment 6 on previous page.

6  
(cont.)

clams found in intertidal areas. Threats to this species include habitat loss, predation and human disturbance. Recommendations regarding habitat for plovers and terns also apply to American Oystercatcher. This species is protected by the federal Migratory Bird Treaty Act.

4. **Least Tern (*Sterna antillarum*)** – This species is rapidly declining in Delaware, and is considered a species of High Concern, according to the North American Waterbird Conservation Plan<sup>4</sup>. Like Piping Plovers, Least Terns nest in flattened, wide open, sparsely vegetated dune and beach areas between 1 May – 31 August. In addition to habitat loss, Least Terns suffer from direct predation and harassment by predators and human disturbance. At DSSP, red fox (*Vulpes vulpes*) and other predators have been observed harassing nesting colonies during midday. Eggs may be eaten by predators or abandoned by adults repeatedly harassed by predators or people. Chicks are vulnerable to predation, and disturbance from people and pets walking along the beach and surf in front of a colony. Young chicks capable of walking away from the colony are vulnerable to trampling and being crushed by vehicle traffic along the beach. Though beach and foredune areas south of the inlet were suitable for a sizable colony of Least Terns in 1996, this colony failed to produce chicks (due to predation and human disturbance) and fewer and fewer pairs returned to the park in subsequent years. Recommendations regarding habitat for plovers and terns apply to Least Terns as well. This species is protected by the federal Migratory Bird Treaty Act.

5. **Common Tern (*Sterna hirundo*)** – Though Common Terns traditionally nest in beach and dune habitat similar to those areas used by Least Terns and Piping Plovers, this species has not nested on Delaware beaches in sizable colonies since the 1960s. Loss of beach habitat suitable for large colonies, human disturbance and predation likely contribute to the absence of this species on Delaware beaches. Although single pairs have intermittently attempted to nest in DSSP in recent years, most of Delaware's Common Terns now nest on marsh islands in the Inland Bays. We are uncertain whether Common Terns would respond to beach-dune habitat enhancement efforts. However, strategies for preserving sparsely vegetated blowouts and flattened dune profiles might attract nesting Common Terns as well as species mentioned above. Recommendations regarding habitat for other beach-nesting birds also apply to Common Terns. Nesting may occur between 1 May – 31 August. This species is protected by the federal Migratory Bird Treaty Act.

6. **Black Skimmer (*Rynchops niger*)** – The Black Skimmer requires open, sandy, sparsely vegetated habitat similar to areas used by other beach-nesting birds. Like Common Terns, Black Skimmers have not nested in Delaware since sometime in the 1970-80's, when colonies were documented at various sites throughout DSSP, from Tower Rd to south of the inlet. Lack of habitat, predation and human disturbance contribute to the absence of nesting skimmers, and like the Common Tern, we are not certain whether Black Skimmers would respond to habitat enhancements. Recommendations regarding habitat for other beach-nesting birds apply to the Black Skimmer. Nesting may occur

<sup>4</sup> Kushlan, J.A. 2002. Waterbird Conservation for the Americas: North American Waterbird Conservation Plan, Version 1. U.S. Fish and Wildlife Service, Washington D.C. 78 pp.

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 (cont.) ↑

between 1 May – 31 August. This species is protected by the federal Migratory Bird Treaty Act.

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7. **Brown-headed Nuthatch (*Sitta pusilla*)** – Brown-headed Nuthatches nest in dead branches or dead standing trees, typically in open loblolly pine forest. The record for this species at DSSP is south of the SE Day Area parking lot, where nuthatches were heard calling from the pines during the breeding season. Habitat at this site may be marginally suitable. Any efforts to remove Japanese black pines (*Pinus thunbergiana*) from the park should occur outside the nesting season for this species. Nesting may occur 15 April – 30 June. This species is protected by the federal Migratory Bird Treaty Act.

8

8. **Tiger beetles (*Cicindela marginata* and *C. lepida*)** – *Cicindela marginata* (no common name applied) is found on intertidal mud and sand flat habitats along coastal areas. This species is rare in Delaware, but has been documented at DSSP as recently as 2000. Another state-rare tiger beetle that may occur at DSSP is *C. lepida* (Little white tiger beetle). This species is listed as State Endangered, and is found in light-colored sands of sparsely vegetated dunes and blowout areas. Little white tiger beetles spend two years as larvae buried in the sand. During feeding periods, they are found just below the surface waiting for prey to pass over the burrow entrance. During dormant periods, the larvae overwinter a foot or more below the surface of the sand. This species is highly susceptible to heavy foot and vehicle traffic, and dune stabilization degrades habitat for this species. *Cicindela lepida* has not been documented at DSSP, however, extensive surveys for this species have not yet been conducted throughout suitable habitat.

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9. **Bethany firefly (*Photuris bethaniensis*)** – Until recently, the Bethany firefly was ranked GH (“globally historical”) by NatureServe, but in 1998 Delaware’s natural heritage zoologist rediscovered this species during a systematic search of potential habitat in Delaware<sup>3</sup>. As a result, the global rank was changed to G1? (Critically Imperiled). The survey was conducted in Atlantic coastal dunes from Fenwick Island to Cape Henlopen State Park. The firefly was found at all three state parks, with the best occurrences found on private land just south of DSSP and on DSSP property, north of Savage’s Ditch and east of Route 1. This species is associated with intertidal swales; four occurrences were in Round-head Marsh – Common Threesquare Intertidal Swale (*Juncus scirpoides* – *Schoenoplectus pungens* Herbaceous Vegetation). This community is ranked S2, but is the most common swale community type. Four additional Bethany firefly occurrences were associated with swales, but the natural community type found in these swales is not yet defined. The “Preferred Alternative” as presented in the Draft Alternatives document (9 October 2003) does not appear to impact swales with known firefly occurrences. The nearest occupied swale is located adjacent to the 3Rs parking lot on the north side, and a visual record for this species was documented halfway between 3Rs and the SE Day Area

<sup>3</sup> Heckwacher, C.M. 1998. Inventory of Delaware’s coastal dune systems for extant populations of *Photuris bethaniensis*: A lampyrid firefly. Delaware Department of Natural Resources and Environmental Control, Dover, DE. 19pp.

Heckwacher, C. M. and C. R. Bartlett. In press. Rediscovery and habitat associations of *Photuris bethaniensis* (Coleoptera: Lampyridae). The Coleopterists Bulletin.

**Comment 7**

**Response:**

The most suitable habitat for this species within the project area is the scattered Japanese black pines interspersed with the beach heather dwarf shrublands and the bayberry/beach plum maritime shrublands in the southeastern quadrant of the project area. It was noted in the correspondence that this habitat is marginally suitable. As stated above, impacts to the backdune habitat in the southeast quadrant of the study area are unavoidable without causing large impacts to the tidal salt marsh west of SR 1. The density of the Japanese black pine trees is low within the project’s LOC when compared to areas of the Delaware Seashore State Park (DSSP) to the north and south of the project LOC. Additionally, DNREC– Parks has recommended the removal of the Japanese black pine since it is an invasive species and through its removal native species will be encouraged to recolonize, thus improving the habitat in the project area.

**Comment 8**

**Response:**

*Cicindela marginata* utilizes intertidal sand and mud flats. These habitats, located west of the project LOC, will not be impacted. The preferred habitat of *C. lepida* is overwash sand flats and back dunes similar to those located in the northeast quadrant of the project LOC. Efforts to avoid impacts to the backdunes and overwash areas in the northeast quadrant make impacts to *C. lepida* back dune habitat unlikely. Also, the comment noted that *C. lepida* is susceptible to heavy foot traffic, and thus it is highly unlikely that this species was or is present in the dune-restoration area due to heavy usage by beach goers. These species are unlikely to be impacted by the project.

**Comment 9**

**Response:**

This species prefers dune swale wetlands habitat. This habitat was identified in the field at several locations south of the inlet and east of SR 1, and DNREC has identified swale wetlands inhabited by this species well beyond the project area near Conquest Road to the north and 3R’s Road to the south. The selected alternative does not impact habitat utilized by this species.

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 (cont.)

on the east side of Route 1. As previously mentioned, a swale north of Savage's Ditch is occupied, and a single specimen was collected north of Conquest Rd east of Route 1. Dune stabilization that results in the filling of blowout areas is a primary concern; dune blowouts serve as potential sites for swale development in this dynamic landscape. Existing swales that are, or potentially, occupied by the Bethany firefly should remain undisturbed.

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**10. Diamondback Terrapin (*Malaclemys terrapin terrapin*)** -- The Diamondback terrapin is a brackish water turtle found in the state's coastal inland bays, Delaware Bay and its tidal brackish tributaries. This species is ranked SU in Delaware, which indicates that it may be a species of conservation concern, but there is inadequate data to determine degree of rarity. The Northeast Wildlife Diversity and Endangered Species Technical Committee considers the Diamondback terrapin a species of regional concern, and one that **may** warrant federal protection<sup>6</sup>. This species spends most of its life in the water, until spring when (primarily) females seek open, upland sandy areas to lay eggs. Primary threats to this species in the vicinity of the project site are 1) loss of open upland sandy nesting habitat resulting from development, 2) loss of access to habitat due to alteration of the shoreline (bulkheading and riprap), 3) road mortality along roadways, and 4) predation of nests and hatchlings. Road mortality has been monitored by Division of Parks and Recreation staff for the past three years, and by concerned citizens before that time. More than 100 road-killed terrapin per year have been documented along Route 1 through DSSP; this number is likely conservative because the monitoring program probably under counts early spring and fall hatchlings which are very small and difficult to detect. Predators may also remove roadkills before they are counted. The use of fencing with erosion fabric has had some degree of success in areas of high road mortality, however, the effects of the fencing on the ability of terrapins to reach nesting habitat are unknown.

Culverts under roadways have been used with success at sites with high wildlife road mortality. Because this project increases the amount of nesting habitat bisected by roadways, we strongly urge the consideration and incorporation of culverts, particularly on the south side of the inlet. This area has little nesting habitat on the west side of the highway, and increased contraction and bulkheading south of the inlet and park may be causing terrapins to seek nesting areas south of the inlet. This project presents an opportunity to install culverts under the road allowing terrapins access to upland nesting areas. North of the inlet, there may be opportunities within the park to create or restore upland sandy nest sites on the west side of Route 1, to mitigate for habitat loss resulting from road and bridge construction. Any efforts to plan or implement these types of activities (culverts or creation of nesting habitat), particularly design specifications and selection of specific sites, should be carefully coordinated with Holly Niedersitter (Endangered Species Biologist, DE Div. of Fish and Wildlife) and Rob Line (Program Manager, Natural Areas Program, DE Div. of Parks and Recreation).

<sup>6</sup> Thomas, G.D. 1999. Wildlife species of regional conservation concern in the northeastern United States. *Northeastern Wildlife* 34:93-100.

**Comment 10**

**Response:**

Diamondback Terrapins utilize open, upland sandy areas as nesting habitat. Within the project area, potential upland nesting habitat exists on both the east and west sides of SR1. The project will impact open, sand upland habitat suitable for Diamondback Terrapin nesting north of the inlet on both sides of SR 1, and also in the southeast quadrant of the project LOC. As noted in the comment, this species is primarily aquatic, foraging in the inland bays, although the females seek out upland nesting locations in the spring to lay eggs. This situation poses a unique problem for the Diamondback Terrapins since the aquatic habitat favored by the Diamondback Terrapins is located west of SR 1 and often extends right up to the roadway while the open uplands suitable as nesting habitat is often located east of SR1. This situation results in high levels of spring-time turtle mortality as gravid females attempt to cross the road to find suitable nesting habitat. DeIDOT has researched opportunities to protect Diamondback Terrapins and has reached agreement with DNREC on appropriate measures to provide Terrapin Habitat Restoration as part of the projects Conceptual Mitigation Plan in Appendix B of the Final Environmental Assessment.

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**11. Seabeach amaranth (*Amaranthus pumilus*)** – Seabeach amaranth is listed as Threatened under the federal Endangered Species Act, and is considered globally rare (G3). This species was rediscovered in 2000 on Delaware’s Atlantic coast beaches after more than 100 years of apparent absence. *Amaranthus* plants were found growing on open sand near the base of the primary foredune and projecting, on average, 15 meters from the base of the dune. *Amaranthus* plants are associated with a rack line, which appears to be composed primarily of broken and decomposing canes of *Phragmites australis*; this rack line may serve as a seed trap for *A. pumilus*. In 2000, 41 individual plants were found growing primarily at DSSP between Keybox Rd. and Tower Rd. In 2001, a total of 83 individuals were found, with 50 between Keybox Rd. and Tower Rd. and 17 south of the inlet. In 2002, a total of 493 plants were found, with 397 between Keybox Rd. and Tower Rd., 22 between the inlet and Keybox Rd., and none south of the inlet. Far fewer individuals were discovered in 2003; only 13 plants were found along the entire Delaware coast. Five were between the inlet and Keybox Rd., and 6 were between Keybox Rd. and Tower Rd. Though many plants were discovered the year before, they were described as small in size and stature. As a result, seed production was very low. This is an annual species, and its distribution and abundance from year to year is dependant on seed production. We are uncertain what factors may affect plant vigor and seed production, but weather patterns, changes in beach profile from storms, and currents carrying seed from other sites may also contribute to fluctuations in the population from year to year. Threats to this species include habitat loss from development, off-road vehicles (ORV), trampling, beach replenishment and dune stabilization using heavy equipment.

**Comments on Mortality of Birds at Tall Structures:**

Many bird species, particularly small songbirds and shorebirds, migrate at night along weather fronts and with prevailing winds during spring and fall migration (March-May and July-October, respectively). Massive numbers of birds can concentrate along a weather front; radar has documented the passage of hundreds of thousands to millions of birds within a few miles along a front<sup>7</sup>.

When these migration events clash with inclement local weather conditions (overcast sky, low cloud ceiling, fog, mist, drizzle or rain), birds are forced to fly at lower altitudes, thus increasing the risk of collision with tall structures. Mass mortality of birds, sometimes on a single night, has been extensively documented in the literature for tall structures around the world<sup>8</sup>. Tall structures and guy wires that are invisible in the dark may be struck by large numbers of birds, but just as deadly are lighted structures that effectively attract birds. Birds attracted to lights may become disoriented and reluctant to leave the lighted area, flying around until exhausted<sup>9</sup>. Alternatively, birds attracted to lights mounted on a structure may simply strike the structure itself.

The type of lighting used to illuminate a structure seems to affect the hazard posed to migratory birds. The effect of light-flash duration may be particularly critical, perhaps more

<sup>7</sup> Kerlinger, P. 1995. How birds migrate. Stackpole Books, Mechanicsburg, PA. 228 pp.

<sup>8</sup> USFWS. Avian Collisions at Communication Towers – Sources of Information. <http://migratorybirds.fws.gov/issues/towers/towers.htm> (October 2003).

<sup>9</sup> Mezure, M. FLAP: Fatal Light Awareness Program. <http://www.flap.org/news/nextpage2.htm> (October 2003).

12

**Comment 11**  
**Response:**

This plant species grows along the beach front, at the based of the fore dune, often along the rack line. This habitat is only present near the project LOC immediately north of the inlet near the dune restoration area. This area is subject to frequent and heavy erosion due to the proximity of the inlet and the jetties. It is also subject to heavy foot traffic from beach goers. While this area is physically suitable habitat, it is very unlikely to support a population of sea beach amaranth due to frequent disturbance, both human and natural. The project does not approach the beach-front habitat south of the inlet. The project does not impact any other areas that are physically suitable habitat for this species.

**Comment 12**  
**Response:**

An extensive literature search of existing information relating bird mortality to bridge structures was conducted. The majority of the literature suggested that bird mortality is related to communication towers, wind turbines, reflective windows in tall buildings and power lines. None of the research relates bird mortality specifically to bridge structures. However, the literature does show that birds collide with power lines, transmission towers and guy wires due to their virtual invisibility.

The proposed bridge design involves lighting the cable stays, low-level pedestrian path lighting, and aerial and navigational beacons. The support cables sheath for the cable-stayed bridge are at the least 10.75 inches in diameter and slightly larger in diameter at the top and bottom of the support cables. The outer surface of the sheath is polished with an abrasive cloth; this process helps reduce the reflectivity of the otherwise mirror type finish of stainless steel. At night recessed lights will shine upwards on the cable stays and arch. These lights will be treated with a blue lens, which was chosen because the blue light is not as sensitive to birds.<sup>1</sup> The cable stay and arch uplighting will be on from dusk to dawn.

Additional lighting on the bridge includes beacons for navigation. A single aerial beacon is proposed at the apex of the arch. The beacon is needed to meet Federal Aviation Administration (FAA) regulations for aviation safety. Because a single aerial beacon on the bridge is the minimum requirement, a waiver has been submitted to the FAA for only the

<sup>1</sup> The retina of the bird’s eye is far more sensitive to the red and infrared spectra. Light can affect birds’ behavior both visually and magnetically. All birds species thus far examined have shown to have a narrowly tuned receptor in the red region of the electromagnetic spectrum. Source: Manville, Albert M., USFWS. 2000. *The ABC’s of Avoiding Bird Collisions at Communication Towers: The Next Steps* <http://migratorybirds.fws.gov/issues/towers/abcs.html>

12  
(cont.)

important than color. Steady and pulsating lights with short “off” phases seem to be more attractive to birds, and thus more dangerous, than pulsing lights with long “off” phases<sup>10</sup>. Consideration for impacts to migratory birds should be given priority over purely aesthetic design considerations for lighting. The latest, most up-to-date research on the effects of lighting and other structure features must be reviewed and incorporated into the design of the Indian River Inlet bridge. With the extensive scientific literature available on this topic, it should be possible to engineer a bridge design that does not greatly contribute to bird mortality. Although few studies have specifically evaluated bird mortality associated with bridges, guidelines developed for tall lighted structures (e.g., skyscrapers and communication towers) can be applied to this project<sup>11</sup>. The Natural Heritage staff requests the opportunity to review bridge-span designs, including plans for lighting, as they become available. For each lighting-design alternative, engineers should provide an evaluation regarding potential impacts to migratory birds. A post-construction bird mortality monitoring and / or reporting plan should be incorporated into the design package.

**Comments on native/invasive species:**

Several resources are available to guide the selection of plants for restoration and landscaping associated with this project<sup>12</sup>. In addition to these resources, project coordinators can contact Mr. Bill McAvoy, Natural Heritage botanist (302-653-2889), for assistance with the selection of native species. Species native to surrounding habitats should be used, and species considered invasive should be avoided. The following species are already established in the area, and removal of these species should be considered as part of any habitat restoration work associated with this project.

13

1. *Japanese Black Pine (Pinus thunbergiana)* – Japanese black pine was planted to stabilize the dunes and camouflage military infrastructure in the 1950s. This species is now recognized as invasive, displacing native vegetation and natural plant communities. Birds that prey upon and harass beach-nesting birds, like crows and grackles, nest, roost and perch in these trees bringing them closer to the nesting areas of native, declining species. Japanese black pines should be removed from the dune ecosystem, however, plans to do so should be coordinated with the Natural Heritage and Natural Areas programs.
2. *Asiatic sand sedge (Carex kobovugi)* – This species is native to coastal areas of northeastern Asia. Circumstances surrounding its introduction are unclear, but it may have been planted as a sand stabilizer. This species invades the primary dunes and upper beach, competing with the federally listed seabeach amaranth; the latter is a poor

<sup>10</sup> Manville, A. M. II. 2000. The ABCs of avoiding bird collisions at communication towers: the next steps. Proceedings of the Avian Interactions Workshop, December 2, 1999, Charleston, SC. Electric Power Research Institute (in press). <http://migratorybirds.fws.gov/issues/towers/abc.html> (October 2003).

<sup>11</sup> USFWS. Service Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers. 14 September 2000. <http://migratorybirds.fws.gov/issues/towers/commtrw.html> (October 2003).

<sup>12</sup> McAvoy, W.A. and K.A. Bennett. 2001. The flora of Delaware: An annotated checklist. Delaware Division of Fish and Wildlife, Department of Natural Resources and Environmental Control, Dover, DE. 265pp. Delaware Native Plant Society. 2002. Native plants for restoration and landscaping. Delaware Native Plant Society, Dover, DE. 19pp.

single beacon on the bridge. The beacon will flash red during daytime hours at 40 flashes per minute (FPM). It will alternate red and white during twilight hours; and the beacon will flash red during nighttime hours at 22 FPM. The frequency of the flashes will be between 4 and 6 flashes per second. According to the research available, “the ‘off’ phase of the light seems more critical, the longer the phase the less likely the attraction during foggy, misty, rainy, overcast, low-cloud-ceiling nights.” The proposed ‘off’ phase for the navigational beacon on the bridge is longer than the two to three seconds typically used on communication towers. So a single light with a longer ‘off’ phase during daytime and night time hours will be less attracting to birds than the lighting on communication towers which is linked to bird mortality.

There will be three navigational beacons (channel markers) mounted to the underside of the northbound superstructure segments. The center channel light will be located at the centerline of the bridge and will be red in color. The other two channel markers will be located 100 feet to either side of the bridge centerline (one on each side) and will be green in color. These lights will be on all day and night. These lights are required for navigational safety through the inlet and under the bridge. The lights will be approximately 45 feet above the surface water and should not interfere with bird navigation under the proposed bridge.

Additionally the pedestrian path, ocean side only, will be lit from dusk to dawn with low-level white lights. The lights are recessed within the bridge railing posts. Sources indicate that white lighting is less attractive to birds than red lighting.<sup>2</sup>

Unfortunately, birds collide with numerous obstacles, both natural and of human manufacture that are located along their flight paths. The proposed lighting for the new bridge crossing the Indian River Inlet was designed with an awareness of bird sensitive issues. The lighting design was based on what preliminary literature is available regarding bird mortality and tall structures. The blue uplighting on the bridge was chosen because it is a less sensitive color to birds. The lighting for the pedestrian path is low-level recessed lighting, which should be less attractive to birds. A special waiver has been applied to the FAA in order to only have one aerial beacon on the bridge. The light flash duration of the aerial beacon will flash less frequently than recommended. The proposed lighting of the new bridge should not result in increased bird mortality. In fact, bird collisions in the study area may be reduced because the existing power lines will be placed under the inlet and the existing transmission towers will be removed.

<sup>2</sup> Manville, Albert M., USFWS. 2000. *The ABC's of Avoiding Bird Collisions at Communication Towers: The Next Steps* <http://migratorybirds.fws.gov/issues/towers/abc.html>

13  
 (cont.)

competitor. This species should be targeted for removal. The Natural Areas Program has mapped locations for Asiatic sand sedge. Opportunities to mitigate for habitat impacts could focus on removal of this species; any plans to do so should be coordinated by the Natural Areas Program.

**Summary of Issues:**

Beach-dune habitats and natural communities are threatened range-wide due to rapid development along coastal areas. The rarity of intact natural coastal habitat is reflected in status ranks, particularly at the global level, applied to both natural communities and species associated with the beach-dune ecosystem. Opportunities for preserving these habitats are primarily restricted to publicly owned lands, and thus these resources have been placed largely in the public trust. As a result, impacts to these resources should be avoided to the greatest extent practical and feasible, with only safety and associated engineering factors overriding ecological preservation. With regard to the bridge-span design, consideration for migratory bird safety should be given priority over an aesthetic design.

14  
 (see #6)

- **Dune stabilization** – Although we recognize the need for dune stabilization in some areas to protect the highway, dune blowout areas are one of the most important features of the beach-dune ecosystem. Dune systems with flattened, unvegetated or sparsely vegetated blowout and washover areas provide primary (and in many cases the only) habitat for many species that are declining or have already disappeared from Delaware's beach-dune ecosystem. These include Piping Plover, Least Tern, Common Tern, Black Skimmer, American Oystercatcher, Common Nighthawk, Little white tiger beetle, Bethany flycatcher, and searocket amaranth. Blowout areas also serve as the precursor for the formation of interdunal swales – a critical component of the dune system. Swales are ground-water driven and provide a source of freshwater and invertebrate prey for many species that live in the harsh dune environment, including reptiles and frogs, birds and several insect species that are found only in association with dune swale habitats. Impacts to these areas (degradation or further fragmentation, including filling, raising, vegetating) should be avoided to the greatest extent feasible during the road and bridge construction phases, and during restoration and stabilization phases of the project. At present, dune blowout and washover areas are found primarily in the northeast quadrant of the study area and further north. Planning and implementation of work in these areas should be closely coordinated with Natural Heritage and Natural Areas biologists.

15  
 (see #10)

- **Upland dune communities** – Upland sandy areas on the west side of Route 1 in the northwest quadrant provide nesting habitat for Diamondback terrapins. Culvert construction south of the inlet can facilitate terrapin access to nest sites in the southeast quadrant. Open sandy areas among beach headier may be used by Common Nighthawk for courtship and nesting. Areas of shrub scrub habitat along the coast provide important stopover habitat for many neotropical migrants<sup>15</sup>. Flocks of birds that follow coastlines during migration stop to feed on invertebrates and fruit produced by these species. These

<sup>15</sup> Mabey, S.B., J. McCann, J.L. Miles, C. Berden, P. Kerfoot. 1999. The neotropical migratory songbird coastal corridor study. Final report. A report to the Virginia Department of Environmental Quality to the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management pursuant to NOAA Award No. NA50AA-H-CR295. 72 pp.

**Comment 13**

**Response:**

DelDOT has coordinated with Bill McAvoy (DNREC—Natural Heritage) and obtained a list of suitable native species to be utilized throughout the project. Careful attention has been paid to plant the appropriate native species in the dune restoration area. While there are no plans to institute a park-wide plan to eliminate invasive species; all invasive species will be removed from the dune restoration area. Also, Japanese black pines will be removed from a small area immediately north of the restoration area and along the east side of SR 1 within the LOC.

**Comment 14**

**Response:**

See Comment 6 above.

**Comment 15**

**Response:**

See Comment 10 above.

15 (cont.)	<p>communities are rare not only in Delaware, but are threatened rangewide primarily due to development.</p>
16 see #10)	<ul style="list-style-type: none"> <li>• <b>Diamondback terrapins</b> – As stressed previously and repeated here, any sites proposed for culvert installation or nesting habitat creation/restoration should be closely coordinated with Natural Heritage endangered species biologist, Holly Niederriter, and Natural Areas program manager, Rob Line. This project presents an opportunity to implement measures that can help mitigate impacts resulting from this project. However, planning for both types of projects must carefully consider the species ecology, habitat juxtaposition within the landscape, and any potential outcomes and secondary effects of culvert installation and habitat restoration.</li> </ul>
17 see #13)	<ul style="list-style-type: none"> <li>• <b>Native species</b> – Species native to surrounding habitats should be used for restoration or landscaping work associated with this project. The Natural Heritage Program should be consulted for input on the selection of plant species. In addition, published resources are available to help develop species lists; these references are provided above under footnote #12.</li> </ul>
18 see #10)	<ul style="list-style-type: none"> <li>• <b>Invasive species removal</b> – Dune restoration efforts to mitigate habitat impacts resulting from this project should include removal of invasive species from the dune ecosystem. Precise locations, timing and methods used to remove invasive species should be determined by the Natural Areas and Natural Heritage programs. Leadership of this effort should be left to the discretion of the Natural Areas Program.</li> </ul>
19 see #12)	<ul style="list-style-type: none"> <li>• <b>Migratory bird mortality</b> – The latest, most up-to-date research on the effects of lighting and other features must be reviewed and incorporated into the design of the Indian River Inlet bridge. With the extensive scientific literature available on this topic, it should be possible to engineer a bridge that does not greatly contribute to bird mortality. Although few studies have specifically evaluated bird mortality associated with bridges, guidelines developed for tall lighted structures (e.g., skyscrapers and communication towers) can be applied to this project. The Natural Heritage staff requests the opportunity to review bridge-span designs, including plans for lighting, as they become available. For each lighting-design alternative, engineers should provide an evaluation regarding potential impacts to migratory birds. A post-construction bird mortality monitoring and / or reporting plan should be incorporated into the design package.</li> </ul>
20	<p>Lastly, note that we have previously requested consideration of a raised causeway alternative; however, due to cost restraints, this alternative was not entertained. If the opportunity for additional funding should arise, we recommend investigating the use of causeways in this ecosystem. We offer the following reasons for why a causeway alternative should be considered, however we acknowledge that the logic behind these statements would require further dialogue with engineers and coastal geologists to evaluate whether they are plausible.</p> <ol style="list-style-type: none"> <li>1) Causeways are less likely to impede natural processes, such as sand transport and creation of overwash areas during storms. Currently, any sand that is blown over the</li> </ol>
	<p>13 November 2003                  Indian River Inlet Bridge Draft Alternatives Comments</p> <p>Natural Heritage &amp; Endangered Species                  DE Division of Fish and Wildlife, DNR&amp;EC                  Page 11 of 13</p>

**Comment 16**

**Response:**

See response to Comment 10 above.

**Comment 17**

**Response:**

See response to Comment 13 above.

**Comment 18**

**Response:**

See response to Comment 13 above.

**Comment 19**

**Response:**

See response to Comment 12 above.

**Comment 20**

**Response:**

While a raised causeway alternative may have some wildlife benefits, it will still impact the wetlands through shading affects and additional visual affects on the Delaware Seashore State Park. Therefore, it was determined that the higher costs of construction and maintenance of a raised roadway far outweigh any potential wildlife or natural community benefits; thus this option was determined to be a cost-ineffective alternative.

See response to Comment 20 on the previous page.

20  
(cont.)

road must be removed to allow safe traffic flow. With a raised causeway, there would be less need to build and stabilize dunes, thereby allowing dynamic processes to maintain habitat for species of conservation concern.

- 2) Causeways would provide safer passageways for species, such as diamondback terrapins and other turtle species, as well as other vertebrates and invertebrates that regularly move among bay, marsh and beach-dune habitats throughout their annual life cycle.
- 3) Although initial costs and perhaps maintenance could be higher than the current road bed, a causeway would reduce the need for mowing and for sand removal after storms. Also, the road would be less likely to flood during storms, providing a safer evacuation route.

We appreciate the opportunity to participate in the planning effort thus far, and close by emphasizing that we will continue to coordinate on planning, restoration and other activities that may alter the beach-dune ecosystem.

Sincerely,



Karen A. Bennett  
Program Manager



STATE OF DELAWARE  
 DEPARTMENT OF NATURAL RESOURCES &  
 ENVIRONMENTAL CONTROL  
 DIVISION OF WATER RESOURCES  
 89 KINGS HIGHWAY  
 DOVER, DELAWARE 19901

WETLANDS & SUBAQUEOUS  
 LANDS SECTION

TELEPHONE (302) 739-4691  
 FACSIMILE (302) 739-6304

February 18, 2004

Mr. Thomas Heil  
 RK&K Engineering  
 2901 Eisenhower Blvd.  
 Alexandria, VA 22314

RE: Indian River Inlet Bridge – WE-020/04 and WQ-021/04

Dear Mr. Heil:

The Wetlands and Subaqueous Lands Section has received the permit application for the Indian River Inlet Bridge, the associated construction on SR1 and the utility construction. The project has been placed on hold until additional information is received. We request that you provide the following additional information:

Plans

- 1 | • Please provide typical cross sections for the proposed rip-rap, culvert pipes, box culvert and storm  
 2 | water management areas. Additionally we request that you submit longitudinal sections and typical  
 cross sections of all segments of the roadway.

Fill – Appendix II

- 3 | • Please identify the proposed slopes of the embankments in jurisdictional areas.  
 4 | • Provide more details about the proposed vegetative stabilization along these slopes, as indicated on  
 5 | page 3 of Appendix II.  
 • Why is the concrete retaining wall only present on the western side of the road on the northern side  
 of the bridge?

Rip-Rap – Appendix I

- 6 | • In Appendix I, the wetland numbers, such as W4, W7 and W9 in the chart on page 1 appear to be  
 incorrect and inconsistent with the plans.

Vegetative Stabilization – Appendix I

- 7 | • Provide plans and additional details about the proposed vegetative stabilization. The information  
 you provided suggests that the stabilization will be located in subaqueous lands, but I suspect that  
 there is a miscommunication.

*Delaware's good nature depends on good*

**Department of Natural Resources & Environmental Control  
 Division of Water Resources  
 Wetlands & Subaqueous Lands Section**

**Comment 1**

**Response:**

Typical sections for rip-rap, culvert pipes, pipe outfalls, box culverts, and stormwater management ponds are included in the revised DNREC permit submission dated March 12, 2004. These typical sections or design plans are excerpted from the Intermediate (60%) design plan submission. The following Intermediate (60%) design plans were included in the revised DNREC permit:

- de02IRB.dgn -- sheet no. 62 -- Rip-Rap, culvert pipes, and pipe outfall typical sections
- de06IRB.dgn -- sheet no. 64 -- Box Culvert
- swd1IRB.dgn -- sheet no. 54 -- Storm Water Management Pond A
- swd2IRB.dgn -- sheet no. 55 -- Storm Water Management Pond B
- swd3IRB.dgn -- sheet no. 56 -- Storm Water Management Pond C-1
- swd4IRB.dgn -- sheet no. 57 -- Storm Water Management Pond C-2

**Comment 2**

**Response:**

A longitudinal cross section (roadway profile) and twelve (12) representative roadway cross sections and a cross section location figure were provided to you at the March 4, 2004, agency coordination meeting and in the revised DNREC permit submission dated March 12, 2004. The longitudinal profile is excerpted from the Intermediate (60%) design plan submittal. The twelve (12) representative cross sections include the type and extent of jurisdictional wetland area (ACOE and DNREC) impacted by the project as distributed during the March 4, 2004, agency coordination meeting. The following Intermediate (60%) design plans were included in the revised DNREC permit:

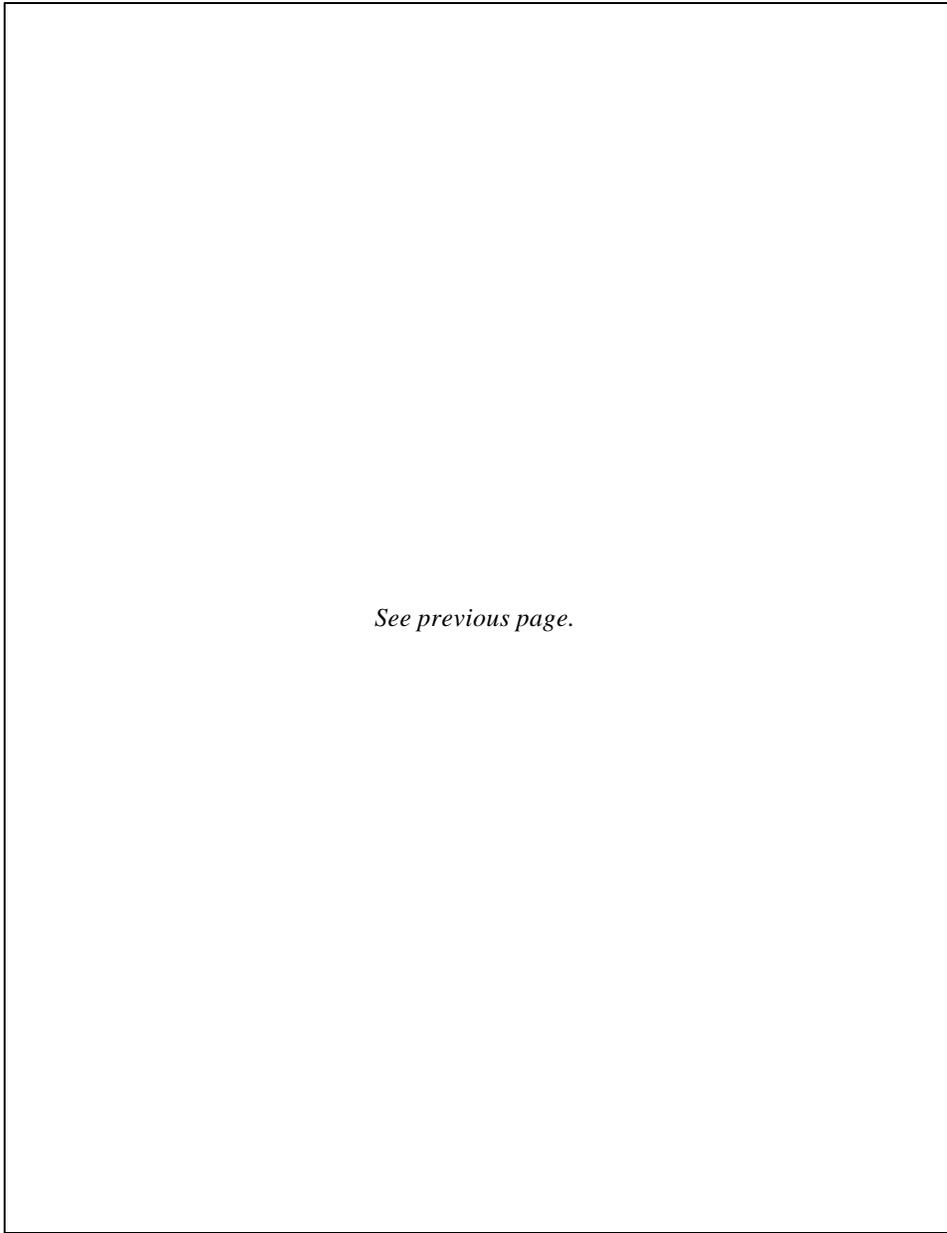
- pr01IRB.dgn -- sheet no. 32 -- Roadway Profile
- pr02IRB.dgn -- sheet no. 33 -- Roadway Profile
- pr03IRB.dgn -- sheet no. 34 -- Roadway Profile
- pr04IRB.dgn -- sheet no. 35 -- Roadway Profile
- pr05IRB.dgn -- sheet no. 36 -- Roadway Profile
- pr06IRB.dgn -- sheet no. 37 -- Roadway Profile

**Comment 3**

**Response:**

The roadway cross slopes in areas of jurisdictional wetlands are typically 4:1 and are shown on representative cross sections provided in the revised DNREC permit and referenced in the response to Comment 2 (above). Typically these slopes abut the western edge of SR1 or the park access roads through the entire length of the project.

**Department of Natural Resources & Environmental Control  
Division of Water Resources  
Wetlands & Subaqueous Lands Section**



*See previous page.*

***Comment 4***

***Response:***

Details about the proposed vegetative stabilization along these slopes are provided in the revised DNREC permit application on page H-3. Landscape plans showing the location of vegetative stabilization on slopes and in the stormwater management areas, excerpted from the Intermediate (60%) design plan submission, have been included in the revised DNREC permit submitted dated March 12, 2004. The following plans were included in the revised DNREC permit submission:

LDR350IRB.CAL through LDR378IRB.CAL -- sheets no. 350 - 378 -- Planting Plans

***Comment 5***

***Response:***

The retaining wall is used along the western side of SR1 (north and south of the Inlet) between the park access roads and the elevated sections of SR1 to minimize impacts to wetlands. The retaining wall allows the park access roads to be located as far east as possible thus minimizing impact to jurisdictional wetlands located west of SR1. The area east of the roadway and north of the inlet will support the project's upland restoration area and pedestrian walkway. This area is designed to represent a natural dune system utilizing the existing bridge abutment. Currently the existing bridge abutment functions as the primary dune. The upland restoration area design builds upon this existing condition and creates a natural landscape with attractive beach access pathways. The incorporation of the upland restoration area north of the inlet and east of the elevated section of SR1 prohibits the use of a retaining wall in this area since the roadway embankment will be part of the dune system.

***Comment 6***

***Response:***

In the revised DNREC permit submission, dated March 12, 2004, Appendix I has been corrected. The plan sheets and permit application reflect the Intermediate (60%) design plan rip-rap locations and sizes for the project.

***Comment 7***

***Response:***

Additional details of vegetation stabilization have been included in the revised DNREC permit submission dated March 12, 2004, specifically Appendix J on page J-1. The following plans were included in the revised DNREC permit submission:

LDR350IRB.CAL through LDR378IRB.CAL -- sheets no. 350 - 378 -- Planting Plans

WE-020/04  
WQ-021/04

Utilities – Appendix E

- 8 • The temporary impacts associated with the utilities removal are quite significant. Can these areas be minimized? For instance, it appears that the 60 foot width of the work area is larger than necessary to achieve the purpose. Can a narrower section of the right of way be used?
- 9 • Provide additional information about the proposed restoration of the impacted areas. What plants do you intend to use? How do you decide whether to plant or seed the disturbed area?
- 10 • It is my understanding that the application for the utility crossing of the Indian River Inlet will be submitted separately.
- We request that you provide information about the proposed location of the buried utilities in the wetlands and subaqueous lands being reviewed in this application process.

Mitigation

- 11 • Please clarify the acreage of wetlands creation at Freshponds North mitigation site. Has the area of existing wetlands been included as part of the restoration or creation?
- 12 • The Wetlands and Subaqueous Lands Section does not consider the Freshponds South site a suitable mitigation site. Because it is isolated and poorly connected to the tide by a ditch system, it appears unlikely to provide significant tidal wetland functions.
- 13 • On page 12 of Appendix M of the application, it states that 7.5 acres of fringe wetlands will be created. Please provide details, such as location and proposed plantings, about this work. Is this considered mitigation?
- 14 • What are the proposed enhancement activities for the diamondback terrapin?

Thank you for this opportunity to comment. If you have any questions, please contact me at (307) 733-4591.

Sincerely,



Kristine Lee Blumhagen  
Wetlands & Subaqueous  
Lands Section

cc: Terry Palmer, DeIDOT  
cc: Joy Reed, DeIDOT

**Comment 8**

**Response:**

The extent of temporary impacts associated with the utility relocation efforts occupy the entire existing utility easement. Although this approach is conservative, it provides the contractor the ability to select the most appropriate access to the utility poles and avoid sensitive resources, if possible. DeIDOT anticipates that because of the soft soils the contractor will use stabilizing matting to access the area thus minimizing potential temporary impacts. Additionally, DeIDOT and the project environmental monitor will be consulted by the contractor concerning access so that additional minimizing efforts can be employed. For these reasons, DeIDOT believes that the width of the temporary impacts, shown on the environmental compliance sheets, are reasonable and appropriate for the utility relocation effort.

**Comment 9**

**Response:**

As noted in response to Comment 8 (above) DeIDOT envisions that the contractor will use mats to access the utilities that require relocation within the tidal marsh. If the contractor utilizes this practice, DeIDOT protocol indicates that additional seeding and/or planting is not be required. However, DeIDOT and the project environmental monitor will closely monitor contractor activities in these and all wetland areas and if disturbance to the tidal marsh is apparent, revegetation may be required. If revegetation is required, DeIDOT will require the contractor to use a seed mix of native wetland species. Revegetation using a wetland seed mix is appropriate in this area due to the productivity of the tidal marsh; that is, the seeded areas will likely revegetate quickly because of good tidal inundation cycles and proliferation of seed source within the marsh.

**Comment 10**

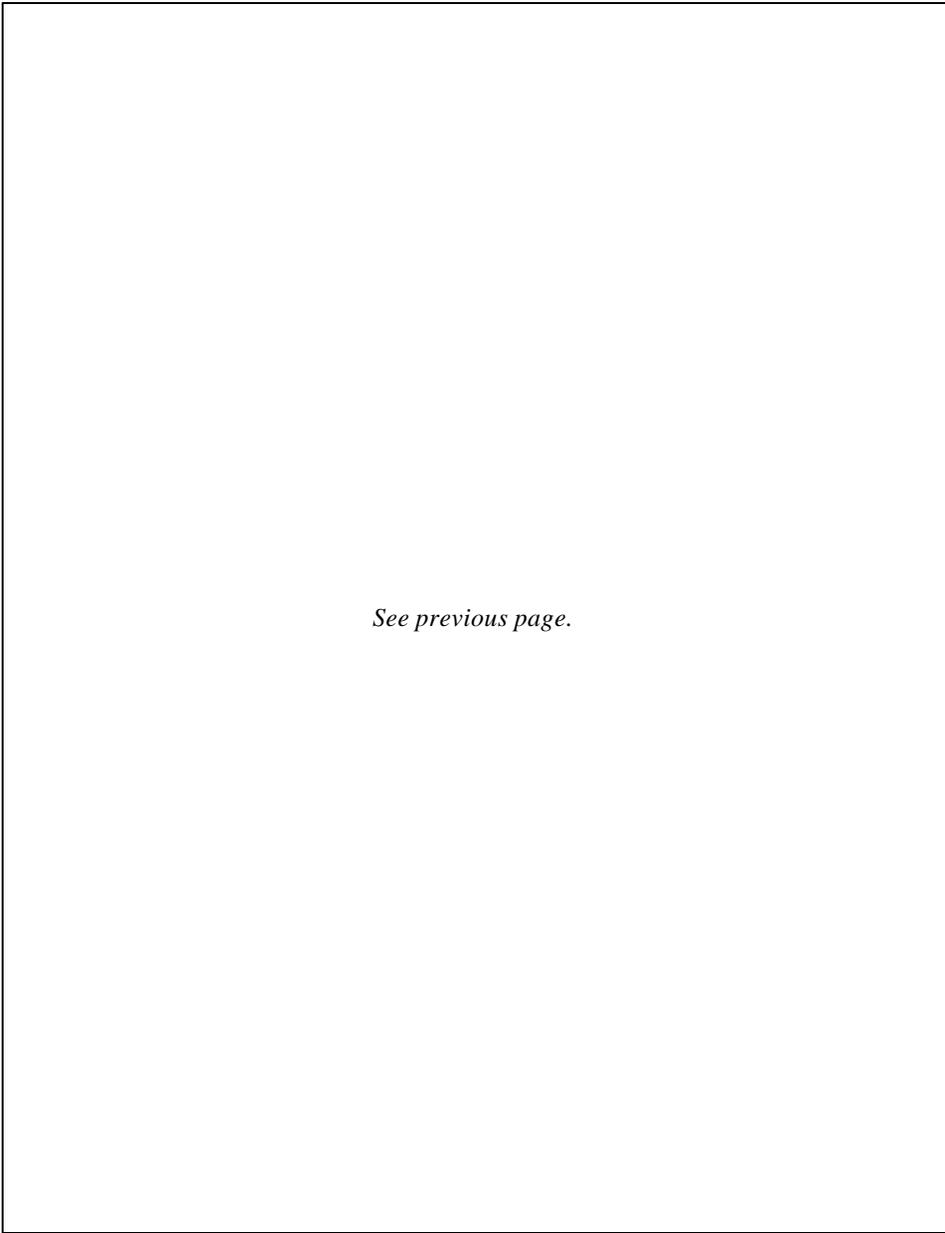
**Response:**

The locations of the utilities included in the Advanced Utility Contract (AUC) have been included on the revised DNREC permit plans set. These locations are based on the Intermediate (60%) design plans and can be found on the DNREC Permit Impacts & Environmental Compliance Plans, sheets 4, 12, 13, 14.

**Comment 11**

**Response:**

The figure included in the handout from the March 4, 2004, agency coordination meeting clarifies the mitigation potential at Fresh Pond north. The project will create approximately 3.1 acres of tidal wetlands and enhance 2.5 acres of tidal wetlands at Fresh Pond north.



**Comment 12**

**Response:**

DelDOT is no longer considering the creation of tidal marsh in the existing borrow pit (west) site (previously the Fresh Pond south site) on the Fresh Pond property owned by DNREC. As discussed during the March 4, 2004, agency coordination meeting, modifications to the existing borrow pit (west) remains an integral part of the DelDOT compensatory mitigation plan; however the current proposal includes creation of an irregularly inundated freshwater marsh. DelDOT continues to evaluate the use of the new Fresh Pond south to meet the projects additional tidal wetland creation need to offset unavoidable wetland impacts to ACOE jurisdictional wetlands.

**Comment 13**

**Response:**

Page M-12 of the permit application has been revised to state "approximately 5.9 acres of fringe wetlands in the form of herbaceous wetland and shrubby wetland complex are planned to be created, expanded and enhanced/restored at the Fresh Pond north site as part of the proposed project.

**Comment 14**

**Response:**

DelDOT is working closely with DNREC (Natural Heritage & Endangered Species) staff to formulate appropriate measures to protect Diamondback Terrapins from impacts associated with the project. The project remains committed to taking action to protect Diamondback Terrapins and as further definition relevant to discussions between DelDOT and DNREC are realized they will be shared with all the regulatory agency representatives.



STATE OF DELAWARE  
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENTAL CONTROL  
DIVISION OF SOIL AND WATER CONSERVATION

DELAWARE COASTAL  
MANAGEMENT PROGRAM

89 KINGS HIGHWAY  
DOVER, DELAWARE 19901

TELEPHONE: (302) 739 - 3451  
FAX: (302) 739 - 2048

March 5, 2004

Mr. Thomas M. Heil  
Rummel, Kelpner & Kahl  
81 Mosher St.  
Baltimore, MD 21217-4250

Re: Delaware Coastal Management Federal Consistency Certification Request  
Replacement of Bridge 156 over the Indian River Inlet (FC 04.027)

Dear Mr. Heil:

The Delaware Coastal Management Program (DCMP) has received and reviewed your consistency determination for the Replacement of Bridge 156, Route 1, over the Indian River Inlet in Sussex County, Delaware. We have reviewed the application and subsequent materials provided at the January 29, 2004 resource agency meeting, including the Draft Environmental Assessment. Based upon this review, the DCMP has the following questions and comments:

1

Relocation of Utility Lines: The DCMP strongly supports adhering to the recommendations of the Natural Heritage Program regarding the directional drilling of utility lines under the Inlet. These recommendations included completing this work prior to April 15 to minimize impacts to marsh nesting birds and ensuring that the campground staging area is located outside of important diamondback terrapin nesting areas.

2

Mitigation of Wetland Impacts: The mitigation plans as outlined in the draft Comprehensive Mitigation Plan dated January 22, 2004 propose creation of 2.8 acres of tidal marsh and approximately 2.7 acres of enhancement of tidal wetlands and uplands at the Freshponds North Site. In addition, 2.5 acres of tidal marsh creation and 0.5 acres of open water enhancement are proposed at the Freshponds South Site.

The creation of wetlands at the borrow pit at the Freshponds South site is a unique way to reuse materials excavated from the Freshponds North Site while addressing a water quality and public safety issue. However, there appears to be little information regarding the extent of tidal influence of the Freshponds South site and it is unclear whether creation of a tidal wetland would be successful at this location. Please provide additional information and justification for this site, including information

**Comment 1**

**Response:**

Throughout the project, including the Advanced Utility Contract (AUC), coordination has been ongoing with DNREC (Natural Heritage and Endangered Species) Staff. Coordination will continue through the completion of the AUC work to ensure there are no adverse effects to the surrounding natural resources.

**Comment 2**

**Response:**

This comment was considered and addressed in the revision of Appendix B, the Compensatory Mitigation Plan, which documents the final proposal for creation, restoration and enhancement to offset unavoidable aquatic resources and upland habitats that will be permanently affected by the project.

Thomas M. Heil  
 March 5, 2004

2 ↑  
 (cont.)

regarding why a larger creation/enhancement project is not proposed at the Freshponds North site.

3

Please also provide the following: 1) a brief description of how the mitigation sites will be monitored for success after creation/enhancement and; 2) final plans when available.

Dune and Upland Restoration: Design plans for the proposed dune creation /enhancement project north of the inlet have not been submitted. Please submit these when available.

4

In addition to this dune restoration project, DelDOT has proposed to remove and restore the existing roadbed to sparsely vegetated upland habitat and to plant a windscreen between the dunes and Route 1. There were some agency concerns regarding re-vegetation of sand wash-over areas because these areas typically provide good habitat for nesting birds. Please provide additional information regarding the extent of the wind screens and their impact on existing dune habitat. Color maps depicting those areas slated for plantings would be particularly helpful.

5

Sand By-pass System: It is our understanding that work is on-going to determine the feasibility of removing pipes associated with the sand bypass system from the bridge and relocating them under the channel. Please provide this feasibility information when available, as well as copies of any agreements regarding this matter.

6

Diamondback Terrapin Hazard Mitigation: The DCMP is encouraged by the Department of Transportation's willingness to help minimize threats posed to nesting and hatching Diamondback Terrapins by traffic on Route 1. DCMP strongly supports the installation of passages underneath the roadbed that would allow safe crossing to nesting areas, but we understand that the science regarding these technologies are limited. Please elaborate on the statement made on Page 2 of Attachment C -- Diamondback Terrapin Research Efforts (January 22, 2004) that states "physical limitations of the site preclude placement" of a large culvert.

7

We strongly encourage the continuation of discussions regarding turtle passages under the roadway. However, we would also support the placement of a hard/fixed barrier in locations that are known to have high levels of mortality. However, this solution alone is not satisfactory because it would result in a net loss of nesting habitat. Therefore, this option should be considered only in conjunction with efforts to enhance terrapin nesting sites on the bayside of Route 1. Please provide additional information regarding diamondback terrapin mortality mitigation measures as they become available.

Coast Guard Approvals: A federal consistency certification concurrence from the DCMP is required for the federal permits and licenses for this project. The DCMP normally provides a single federal consistency concurrence letter that represents concurrence for the project in its entirety and therefore cannot provide a complete

**Comment 3**

**Response:**

This comment has been considered in the revision of Appendix B, the Compensatory Mitigation Plan.

**Comment 4**

**Response:**

This comment was addressed in the revision of Section IV.B.7 Habitats and Wildlife.

**Comment 5**

**Response:**

DelDOT has decided to relocate the sand bypass system on the new bridge. The system will be attached to the westernmost concrete traffic barrier parapet and concealed in a powder-coated steel clamshell-type enclosure for maintenance purposes.

**Comment 6**

**Response:**

The use of culverts as ecopassages for the Diamondback Terrapins is still being assessed by DelDOT. The site limitations that preclude the placement of a culvert with a diameter of 4-6 feet are the flatness of the site and the inability to drain for stormwater runoff. Refer to the Appendix B, for information on the Diamondback Terrapin Research.

**Comment 7**

**Response:**

This comment was considered in the revision of Appendix B, the Compensatory Mitigation Plan.

*No comments on this page.*

Thomas M. Heil  
March 5, 2004

certification for only one aspect of the project. If the Coast Guard requires an additional or earlier certification, we will work with you to provide a letter of intent to them.

Please provide the above requested information as it becomes available. Pursuant to *15 CFR part 930* of National Oceanic and Atmospheric Administration regulations, we are notifying you that our review period will be extended for ninety days to provide adequate time for review of this additional information. The new deadline for this project is July 23, 2004.

If you have any questions or concerns, please contact me at (302) 739-3451 or via email at [Susan.Love@state.de.us](mailto:Susan.Love@state.de.us).

Sincerely,



Susan E. Love  
Delaware Coastal Management Program

Cc: File 04.027  
Joanne Haughey - DWR  
Holly Neiderriter - NHP



STATE OF DELAWARE  
DIVISION OF HISTORICAL AND CULTURAL AFFAIRS  
DELAWARE STATE HISTORICAL PRESERVATION OFFICE  
21 THE GREEN, SUITE A  
DOVER • DE • 19901-3611

TELEPHONE: (302) 739-5685

FAX: (302) 739-5660

January 29, 2004

Ms. Therese M. Fulmer, Manager  
Environmental Studies  
Delaware Department of Transportation  
800 Bay Road, P.O. Box 778  
Dover, DE 19904

RE: Indian River Inlet Bridge Replacement Project (Bridge 156, carrying SR 1 over Indian River Inlet), Sussex County, Delaware; State Contract Number 23-073-03; Federal Aid Project Number BROS-S050(7); Revised Cultural Resource Management Document

Dear Ms. Fulmer:

Enclosed please find our written comments on the report prepared by John Milner Associates, Inc., for the above-referenced undertaking. The majority of the comments concern relatively minor technical issues. Others are more substantive, as we discussed with you at the regular DelDOT/SHPO meeting on January 14, 2004. These include:

- 1 - Archaeological Survey: Clarification of the conclusions regarding the results of the monitoring of geotechnical borings, pedestrian survey of the bridge construction area, and the extent and nature of resources in the wetland mitigation areas is needed.
- 2 - Visualizations for architectural properties: Not certain that the visualization information belonged in the cultural resource survey report. As it is, the report does not adequately relate the visualizations to the resources that the views were intended to represent. Statements in the report regarding no resources being "in the vicinity" are misleading with respect to the intent of the study and how it was approached.
- 3 - Effects: In our view it is inappropriate for the report to cite a specific regulatory finding, since there has been no concurrence on this point, and this is not the purpose of a cultural resource survey document.
- 4 - As Mike Hahn of your office noted with respect to a previous draft that DelDOT reviewed internally, the report is somewhat difficult to follow. It would have been preferable to have the additional survey information integrated, rather than discussed as wholly separate chapters. There are also many technical problems with the report which should be corrected (see enclosed comments).

**Comment 1**

**Response:**

This comment was addressed in revisions to Sections 5.0, 7.0, 6.0, and 8.0 of the Final Cultural Resource Management Report (CRMR).

**Comment 2**

**Response:**

This comment was addressed in revisions to Section 7.0 of the Final CRMR.

**Comment 3**

**Response:**

This comment was addressed in revisions to Section 8.0 of the Final CRMR

**Comment 4**

**Response:**

The Final CRMR addresses this SHPO comment.

Letter to T. Fulmer  
January 29, 2004  
Page 2

In most respects, we find that the revised report meets the applicable *Secretary of the Interior's Standards and Guidelines*, and the DE SHPO's report guidelines, for the level of survey conducted (Phase IA background research for all resources; Phase I identification level archaeological survey for selected areas of the project). See the enclosed comments for the few items that should be added or clarified in order to address the federal and state standards and guidelines.

5 | However, as we also discussed with you on January 14, we will need copies of the project plans  
6 | (preliminary at a minimum, semi-final preferred) for both the bridge construction and the  
wetland mitigation area, before we can agree that no further archaeological investigation is  
needed, or concur with any formal determination about the effects of the undertaking. After we  
have the plans, we would also like to meet on site with representatives DelDOT, DNREC, and  
7 | the consultant. These are standard procedures in consultation between our agencies for projects  
of this nature.

7 | We also recently received a draft Environmental Assessment/Nationwide Section 4(f)/6(f)  
Evaluation for this project, to be discussed at today's Joint Agency meeting. Our cursory review  
of this document indicates that the section discussing cultural resources will require revision to  
provide more accurate information on the resources in the project area, and to clarify the issues  
pertaining to Section 106 consultation.

Thank you for your consideration of these comments. If you have any questions, please do not  
hesitate to contact us.

Sincerely,

Daniel R. Griffith  
Director/State Historic Preservation Officer

Enclosure

cc: Robert Kleinburd, Realty & Environmental Specialist, Federal Highway Administration  
Richard Hassel, Chief, Application Section I, Phila. District, U.S. Army Corps of Engineers  
Michael C. Hahn, Senior Highway Planner, DelDOT (w/enclosure)  
Kevin Cunningham, Archaeologist, DelDOT (w/enclosure)  
Cara Blume, Cultural & Recreational Services Section, Parks & Rec., DNREC (w/enclosure)  
Thomas Heil, Rummel, Klepper, & Kahl  
Wade Catts, John Milner Associates, Inc. (w/enclosure)

**Comment 5**

**Response:**

Per your request, intermediate (60%) design plans were transmitted to SHPO staff for review and comment on February 24, 2004.

**Comment 6**

**Response:**

This site visit occurred on March 3, 2004; please reference the meeting minutes summary that documents the discussions that took place during the site visit.

**Comment 7**

**Response:**

Section IV.C. of the Final Environmental Assessment and Nationwide Section 4(f)/6(f) Evaluation has been updated with the most current cultural resources information and findings as of its date of publication.

January 30, 2004

**Indian River Inlet Bridge Project  
DE SHPO Comments on revised cultural resource management report**

**Main Issues:**

**Archaeology:**

- 8 - \* Pedestrian survey within the area to be directly affected by the construction: The report needs to further explain why the authors deemed that subsurface testing was not necessary. As we recall, in our field meeting of May 2003, we discussed the possibility of the consultant reviewing the results of geotechnical borings that were to be done throughout the project area, to augment the pedestrian survey in determining if additional archaeological investigation is needed. We also raised the question about JMA reviewing this information in our e-mail of October 23, 2003.
- 9 - Geotechnical borings at the abutments: In the early chapters of the report, the consultant builds a case for the potential for presence of archaeological resources within the project area, a case that (according to the report) is supported by the geotechnical boring data. However, it is not clear what type of resource there is potential for, whether or not the construction activities are likely to destroy said resource(s) if present, and if the consultant is saying that further investigation is not warranted or just not feasible (two different issues). In our view, the case for the presence of certain, stable Holocene surfaces in the project area is convincing. However, the presence of such surfaces is not the sole factor in predicting loci of past human activity. Past settlement patterns and landscape use, as they are currently understood, need to be factored in as well.
- 10 - Wetland mitigation areas: Need clarification of both text and graphics regarding the extent of the tested areas, and the extent and nature of the results.

**Architectural - Visualizations:**

11 The camera locations were selected to be representative of the view from known resources at various angles and distances from the proposed new bridge, yet for several locations JMA states there are no resources "in the vicinity". Even if there isn't a resource immediately visible to the spot from which the photo was taken, the report needs to identify the known resources (e.g., Location 6 - White House Farm S-202) or types of resources (e.g., Location 3 - Fire Control Tower, and properties in the Bethany vicinity) that the views were intended to represent. Currently, the report does not consistently do so.

**Conclusions:**

12 While necessary to discuss the potential impacts of the project, it is inappropriate for this document to refer to a specific finding of effect under the Section 106 regulations. This is not the purpose of a cultural resource survey report.

**Comment 8**

**Response:**

This comment was addressed in the revisions to Section 5.3 in the Final CRMR.

**Comment 9**

**Response:**

This comment was addressed in the revisions to Section 5.4 in the Final CRMR.

**Comment 10**

**Response:**

This comment was addressed in the revisions to Section 6.0 in the Final CRMR. Also intermediate (60%) design plans were transmitted to SHPO staff on February 24, 2004.

**Comment 11**

**Response:**

This comment was addressed in the revisions to Section 7.0 in the Final CRMR.

**Comment 12**

**Response:**

This comment was addressed in the revisions to Section 8.0 in the Final CRMR.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

**Primary Technical Comments:**

- 13 - Though photographs are provided, none of the figures identify the locations of the north jetty, nor of the ship's keel or the piece of ship's planking that were identified during the survey. [Note: A possible exception is Figure 8, which shows an unlabeled resource on the northeast side of the 1938 inlet; is this meant to depict the jetty? The dot should either be labeled as to what it represents, or deleted from the figure.]
- 14
- 15 - Chapter 2.0, p. 26, please elaborate on the description of the current bridge, specifically, length and height, as it is relevant to the discussion of visual effects later in the report (i.e., Chapter 7, which should include a comparison of the existing conditions with the specifications of the proposed new bridge).
- 16 - As noted in the cover letter, we agree with Mike Hahn's comment on the earlier draft that DelDOT reviewed internally. While not required, it would have been helpful had the additional survey information been integrated into the previous work, rather than added as separate chapters. This approach would have saved the reader a lot of flipping back and forth in the report, and would have provided a more cohesive discussion of topics that in the current version are discussed in several different places in the text.
- 17 - There are some inaccuracies in the information regarding National Register (NR) listed and eligible properties within the study area. To the best of our knowledge, the five-mile radius study area contains three NR listed properties: (1) the Indian River Life Saving Service Station, which is listed as a building (S-453); (2) the Wilgus Site, a prehistoric period archaeological site (S-686/7S-K-21); and (3) the Poplar Thicket Site, also a prehistoric period archaeological site (S-649/7S-G-22).
- 18 The text of the report acknowledges the Life Saving Station, but not the two sites. In Appendix II, the Wilgus Site is acknowledged as NR listed (though under a different name, i.e., "Slough's Gut Site/White's N"; see p. 34), but does not identify the Poplar Thicket Site as NR listed (see p. 53). Chapter 5, Table 1 lists two National Register listed resources, but the text doesn't specify what they are, so the reader has to refer to earlier chapters (at least, regarding the Indian River Life Saving Service Station) and search the chart in the appendix. Table 1 and the text on page 36 also inaccurately indicate that the two NR-listed properties are both standing structures, and that there are no listed archaeological sites in the study area. The text, table, and Appendix should be corrected.
- 19
- 20
- 21 Additionally, the text on Page 36 and Table 1 is misleading with respect to "eligible" properties, and should be revised. The report should be clear that there are no other properties *known to be eligible* for the NR, but acknowledge that formal evaluations have not been completed for many (if not most) of the resources identified in the 5 mile radius study area. Fire Control Tower 2 and the north jetty should be mentioned in this Chapter, to tie this section back to discussions earlier in the report, noting that these two properties have been identified as likely to be eligible for the National Register. Note also that other properties have been identified as potentially eligible in draft surveys (DelDOT's SR 26 project, and SHPO's ongoing Bethany Beach survey). See also other comments on Chapter 5.0, below.
- 22

**Comment 13**

**Response:**

See Comment 5 above.

**Comment 14**

**Response:**

This comment was addressed in the revisions to Figure 8 in the Final CRMR.

**Comment 15**

**Response:**

Description of bridge project enhanced in Section 2.0 of the Final Management Report.

**Comment 16**

**Response:**

See Comment 4 above.

**Comment 17**

**Response:**

National Register listed and eligible properties have been clarified in the Final CRMR.

**Comment 18**

**Response:**

See Comment 17 above.

**Comment 19**

**Response:**

See Comment 17 above.

**Comment 20**

**Response:**

See Comment 17 above.

**Comment 21**

**Response:**

See Comment 17 above.

**Comment 22**

**Response:**

The Final CPMR includes all known listed and eligible properties as of the date of its file-search (March 2003).

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

23

- Chart in Appendix II, derived from CRS data gathered and integrated into GIS: The chart is difficult to use in general, as the information is spread over a number of pages; it would have been helpful had the CRS\_ID and/or CRSNUM column been included on each successive page for a consistent reference point. See also comments above regarding NR listed properties, and more minor technical comments below.

**Additional Technical Comments:**

**Abstract:**

24

- 1<sup>st</sup> paragraph says that JMA was retained to assist with identification and *evaluation* of cultural resources; no evaluation level survey was conducted for this project.

25

- The abstract should include a brief summary of the conclusions of the investigation.

**1.0 Introduction:**

26

- The project description is extremely brief. Although other parts of the report include additional pieces of information regarding the nature of the project, it would be appropriate for the introduction section to provide a more detailed overview of the undertaking as a whole. This should include the proposed wetland mitigation areas, and other areas that may be affected by other environmental mitigation efforts mentioned in the draft EA, such as the offshore disposal of materials from the existing bridge.

27

- p. 1, last paragraph, states that the "investigations were conducted in accordance with" a number of references, including the federal *Secretary of the Interior's Standards and Guidelines*, the recently drafted SHPO guidance for assessing visual effects, and several state Management plans. The Management plans cited serve to outline historic contexts for different kinds of resources and/or areas in the State, identify research goals and priorities, and in some cases provide a framework for evaluating properties that are identified during survey. But they are not survey guidelines, per se. The SHPO's *Guidelines for Archaeological and Architectural Surveys in Delaware* (1993), written with the intention of assisting researchers to meet the federal Standards and Guidelines, is notably absent from the references cited.

28

- Depiction of the Study Area: We recommend that Figure 26 replace Figure 1 to depict the current study area; Figure 1 (which shows more detail) could then be used in Chapter 3 to illustrate specific locations that are referred to in the text, such as Quillens Point. Minimally, \* an inset map identifying the project location within the State needs to be added, and Figures 1 through 5, 8, 11, 17, 18, 21, 22, and 23 should be relabeled (initial 2-mile study area), as they do not show the complete study area as DelDOT currently defines it.

**Chapters 2.0 and 3.0, general:**

29

- In Chapters 2 and 3, the Figures still inaccurately depict two locations for S-60492.2, the Fire Control Tower. The more southern location appears to be the correct one. This discrepancy was mentioned in discussion of the first draft of the report last May.

**Comment 23**

**Response:**

Appendix II was removed from the Final CRMR. The data will be transmitted in electronic form (database on CD) with the Final CRMR to the SHPO.

**Comment 24**

**Response:**

This comment was addressed in the revisions to the Abstract in the Final CRMR.

**Comment 25**

**Response:**

This comment was addressed in the revisions to the Abstract in the Final CRMR.

**Comment 26**

**Response:**

This comment was addressed in the revisions to Section 1.0 in the Final CRMR.

**Comment 27**

**Response:**

This comment was addressed in the revisions to Section 1.0 in the Final CRMR.

**Comment 28**

**Response:**

An inset map showing the location of the project area within the State of Delaware was added to the Final CRMR. Also, the figures needing the change in text from "Approximate Location of Study Area" to "Initial 2-mile Study Area" will be completed in the revised report.

**Comment 29**

**Response:**

This comment was addressed in the revisions to Section 4.2 in the Final CRMR.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

**2.0 Environmental and Cultural Contexts:**

**2.1 Environmental Overview:**

- p. 3: End of 2<sup>nd</sup> paragraph and beginning of 3<sup>rd</sup> paragraph inconsistent as to characterization of the soils in the survey area. Also, does the characterization change with consideration of the 5 mile radius study area?
- Discussion is focused on soils. Should add general description of the existing conditions of the Study area, particularly in the immediate vicinity of the Bridge.

**2.2 Prehistoric and Contact Period Overview:**

- 2.2.2 Archaic Period: p. 4, identify the location of the Two Guys Site (7S-F-68). Also, **for future reference**, see also Custer 1995, *Identification of Potential Middle Archaic Archaeological Sites in Delaware*, and look for future reports on recent DelDOT investigations of sites that may have Archaic components, e.g.: the Frederick Lodge Site Complex (Parsons, SR 1 project-Smyrna to Pine Tree Corners project); the Beech Ridge Site (URS Corporation, Scarborough Road/Crawford Carroll Avenue project); and Site 7NC-E-152 (KSK, Airport/Churchmans Roads Intersection project).
- 2.2.3 Woodland I Period: p. 5, Woodland I cultural period in Delaware corresponds to the Late Archaic, Early Woodland & Middle Woodland chronological periods of the Mid-Atlantic.

**2.3 Historical Overview:**

- Very thorough overview.
- P. 12, would be helpful if the 1737 Eastburn map were included in the text.
- P. 19 and Figure 5: The 1918 map does not appear to depict a bridge at the inlet of that time, but shows a symbol that is sometimes used to connote a ferry?? Is there documentary evidence suggesting that a bridge was built over the inlet prior to one built in 1933?

**3.0 Baseline Archaeological Field Investigation:**

**3.2 Results:**

**3.2.1 Previously Identified Sites:** Suggest several clarifications:

- 1<sup>st</sup> paragraph, 1<sup>st</sup> sentence: "There are four (4) *known* archaeological sites..."
- 2<sup>nd</sup> paragraph, 1<sup>st</sup> sentence: "Supplemental Phase I investigations *conducted in this area* by JMA *for a different project* concluded..."
- 3<sup>rd</sup> paragraph, 4<sup>th</sup> sentence: "Artifacts were collected...by Glenn Mellin *for the University of Delaware Center for Archaeological Research (UDCAR), under a grant from the State Historic Preservation Office.*"
- 4<sup>th</sup> paragraph, last sentence: "...mid-twentieth century building debris, *associated with former seasonal cabins*, and an isolated..."

**3.2.2 Review of Existing Geoarchaeological Data:**

- Fig. 20 revised figure ok, but need to add the scale for the plan view in the upper right hand corner.
- Clarify 2<sup>nd</sup> and 3<sup>rd</sup> sentences of the last paragraph (as noted previously, the numbers cited here and the figures in the text don't seem to correlate). What are the horizontal termini of the Pleistocene deposit, in terms of distance to the north and south of the current inlet?

- 4 -

**Comment 30**

**Response:**

This comment was addressed in the revisions to Section 2.1 in the Final CRMR.

**Comment 31**

**Response:**

This comment was addressed in the revisions to Section 2.1 in the Final CRMR.

**Comment 32**

**Response:**

This comment was addressed in the revisions to Section 2.2.2 in the Final CRMR.

**Comment 33**

**Response:**

This comment was addressed in the revisions to Section 2.2.3 in the Final CRMR.

**Comment 34**

**Response:**

This comment was addressed in the revisions to Section 2.3 in the Final CRMR.

**Comment 35**

**Response:**

This comment was addressed in the revisions to Section 2.3 in the Final CRMR.

**Comment 36**

**Response:**

This comment was addressed in the revisions to Section 3.2.1 in the Final CRMR.

**Comment 37**

**Response:**

This comment was addressed in the revisions to Section 3.2.1 in the Final CRMR.

**Comment 38**

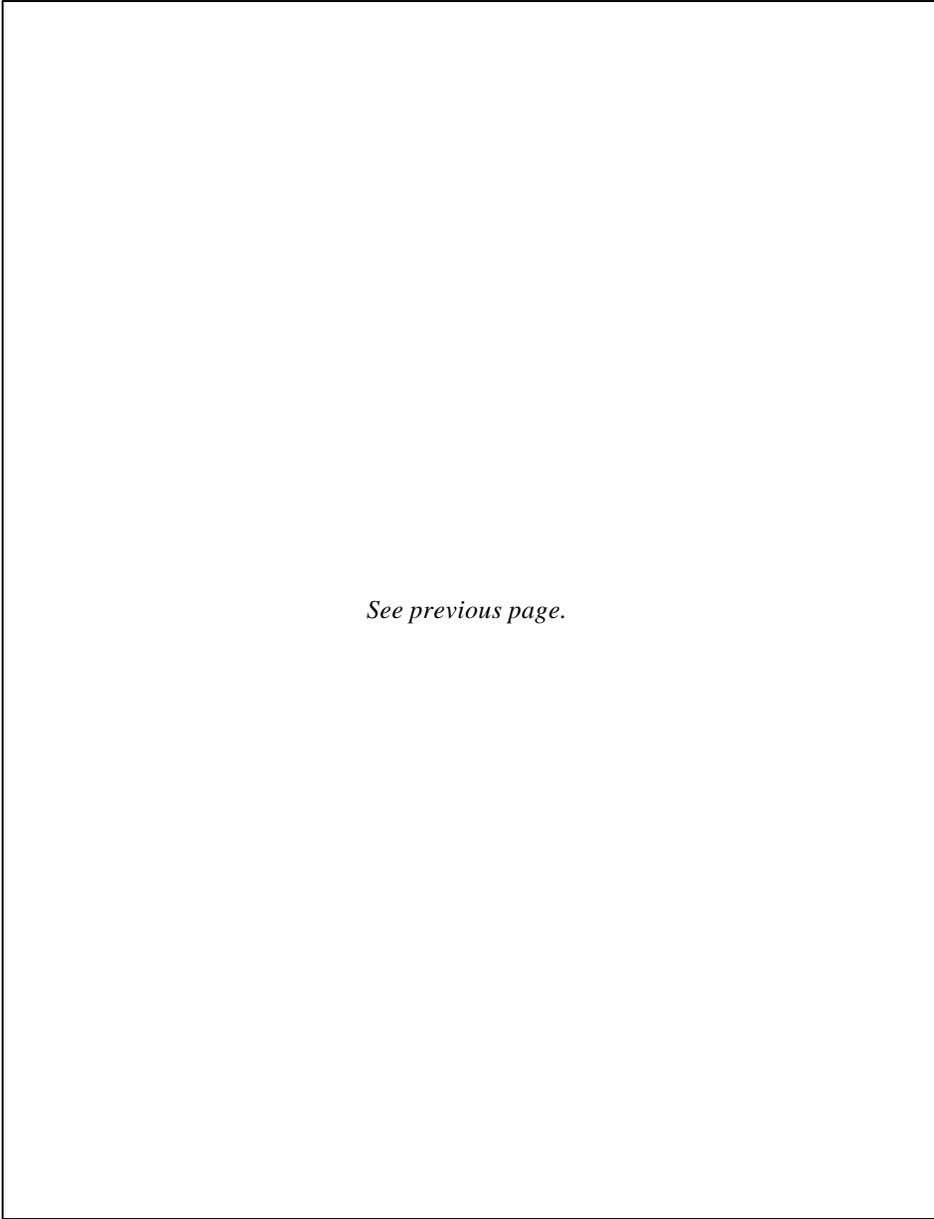
**Response:**

This comment was addressed in the revisions to Section 3.2.1 in the Final CRMR.

**Comment 39**

**Response:**

This comment was addressed in the revisions to Section 3.2.1 in the Final CRMR.



*See previous page.*

***Comment 40***

***Response:***

This comment was addressed in the revisions to Figure 20 in the Final CRMR.

***Comment 41***

***Response:***

This comment was addressed in the revisions to Section 3.2.2 in the Final CRMR.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

3.2.3 **Field View:** As noted above, need to map the approximate locations where the ships keel and ship planking were found.

3.2.4 **Archaeological Sensitivity:**

- Clarify – there's a difference between the potential for sites to be *present* and the potential of being able to *recover* material from sites, *if present*. See comments under Main Issues above.
- Prehistoric Sensitivity:
  - o The distinction between Figures 22 and 23 should be discussed in the text.
  - o P. 31, last sentence, regarding recommendation for further study, reference the work described in Chapter 5.
- Maritime Sensitivity: Aside from the inlet locations, what of the potential for maritime-related resources closer to the surface, such as those observed during the field view? Also, explain why the current inlet is or is not likely to contain such resources. For example, have dredging and scouring reduced the potential for such resources to be present? Did the Corps of Engineers' profile and contour mapping of the Inlet reveal any contours suggesting the presence of wrecks?

4.0 **Baseline Historic Architectural Investigation:**

4.2 **Results:**

4.2.1 **Review of Existing Historic Architectural Data:**

- The report should include at least a basic description of the extant buildings at the Indian River Life Saving Station complex, and make reference to the NR nomination in the Appendix.
- \*Should clarify and/or augment information on the jetty system at the inlet. There is no description of the resource in the report, only the reference to the previous Section 106 review of the U.S. Army Corps' of Engineer's repair project. Since that project was focused only on the repair of the north jetty, the remainder of the jetty system is only discussed briefly in the Corps' letter included in Appendix I. The report should provide additional information, i.e., when was the jetty system built, what comprised the system at that time, and what remains and in what condition? This information is directly relevant to determining the potential effect of the bridge replacement project on this potential historic property.
- Though later in this section (i.e., p. 34), the report indicates that the purpose of this investigation did not include evaluating National Register eligibility of identified resources, the authors nonetheless provide opinions as to the potential eligibility of the Alice Burbage House (S-2564) and the Cape Cod House (S-2569). This is ok, but the basis for their preliminary opinion should be given. [Note also, reference on page 34 to Guerrant lists incorrect date; this publication dates to 1993; the same error is in the bibliography, p.57].

**Comment 42**

**Response:**

See Comment 9 above.

**Comment 43**

**Response:**

This comment was addressed in the revisions to Section 3.2.4 in the Final CRMR.

**Comment 44**

**Response:**

This comment was addressed in the revisions to Section 3.2.4 in the Final CRMR.

**Comment 45**

**Response:**

This comment was addressed in the revisions to Section 3.2.4 in the Final CRMR.

**Comment 46**

**Response:**

This comment was addressed in the revisions to Section 4.2.1 in the Final CRMR.

**Comment 47**

**Response:**

This comment was addressed in the revisions to Section 4.2.1 in the Final CRMR.

**Comment 48**

**Response:**

No changes made.

**Comment 49**

**Response:**

This comment was addressed in the revisions to Section 4.2.1 and the Bibliography in the Final CRMR.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

#### 5.0 Additional Services:

##### 5.1 Additional GIS Data Collection:

- 50 - See comments above about inaccuracies in the text and Table. Also, if the numbers given represent the total of previously inventoried resources within the study area, shouldn't there have also been one historic period archaeological site (i.e., S-9804/7S-G-156)?
- 51 - Figure 27: Caption should indicate that the map depicts locations only of the previously surveyed resources in the study area (e.g., the 3 cottages JMA identified on Quillens Point are not shown).

- 52 **5.2 Pedestrian Survey:** The overview in Section 3.0 and the introductory paragraph here (page 37) make a case for why sites could be expected to be found in the areas surveyed, either on the surface, deeply buried, or somewhere in between. Therefore, as noted above, it is important that the report explain what was observed during the pedestrian survey, and/or found during the background research and other information (e.g., profiles from geotechnical borings, see Main Issues above) that led to the conclusion that subsurface testing was not necessary to confirm that sites are not present here. Also, as we have previously informed DelDOT, more detailed project plans are needed to confirm that the survey described in the report sufficiently covers those areas (both the horizontal and vertical extent) that will in fact be disturbed by construction, staging, stockpiling, mitigation or other project-related activities.

##### 5.3 Monitoring of Geotechnical Borings:

- 54 - Note who performed the actual borings (as written, the report implies that JMA performed this work, as opposed to JMA just monitoring the boring process and inspecting its products).
- 55 - P.38, 3<sup>rd</sup> full paragraph, and p. 39, 1<sup>st</sup> paragraph: characterize the "additional soil horizons" found below the organic layers.
- 56 - P. 39, concluding paragraph is vague as to the probable nature and extent of the construction disturbance, in relation to the potential for archaeological resources to be present, and therefore presumably destroyed by the construction. Clarify the archaeological potential of these locations, at the depths noted. As noted in the comments under Main Issues above, the report provided the basis for indicating that there is potential for ancient, stable surfaces that could support human occupation, but then falls short of defining the nature of that potential. This is in part due to the use of general terms, such as "archaeological information", "cultural material", etc. The report should clarify what is actually likely to be found on these surfaces, or within the identified horizons. Isolated finds? Intact sites? Disturbed sites? Explain why, in this chapter, the potential for "intact cultural material" is deemed to be low. Additionally, get information from RK&K (as described at the August 21, 2003, meeting at DelDOT) about what will be constructed at the locations investigated, and what methods will be used for construction. What would constitute "safe, economical and efficient" ways of investigating these locations, and why are such methods not practicable here?
- 57

- 6 -

#### Comment 50

##### Response:

This comment was addressed in the revisions to Section 5.2 in the Final CRMR.

#### Comment 51

##### Response:

This comment was addressed in the revisions to Figure 27 in the Final CRMR.

#### Comment 52

##### Response:

See Comments 1 and 8 above.

#### Comment 53

##### Response:

Per your request, intermediate (60%) design plans were transmitted to SHPO staff for review and comment on February 24, 2004.

#### Comment 54

##### Response:

See Comments 1 and 9 above.

#### Comment 55

##### Response:

See Comments 1 and 9 above.

#### Comment 56

##### Response:

See Comments 1 and 9 above.

#### Comment 57

##### Response:

See Comments 1 and 9 above.

Jan. 30, 2004 **DE SHPO Comments: IRIB revised cultural resource management report**

- As noted in the Main Issues comments above, we previously raised the question about other geotechnical borings that were apparently being done in areas to be directly affected by construction (the specific locations are identified in a DelDOT letter to the Corps of Engineers, dated October 7, 2003). We asked that if any of these areas have been (or needed to be) reviewed by JMA, and if the results of those investigations have been (or would be) made available to JMA. DelDOT still needs to address this point, and if JMA did review that information, it should be cited in the report. As noted, above this information may help support the consultant's recommendation that no further archaeological investigation is needed in these areas.

**6.0 Phase I Archaeological Investigation of the Fresh Pond Wetland Mitigation Area:**

**6.3 Methods:**

- 58 - p. 41, top of page: Cite the purpose of the augur tests, and describe how their locations were selected.
- 59 - p. 41, 2<sup>nd</sup> paragraph: Define "limit of practical excavation" and "limit of practical auguring".
- 60 - Should reference that radials (at closer intervals?) were placed in locations where artifacts were encountered.

**6.4 Results of Field Investigation**

- 61 - p. 41, 1<sup>st</sup> paragraph under heading:
  - o This could have been included as part of the methods section.
  - o It's not clear why Figure 26 is referenced here.
- 62 - Figure 32:
  - o Label the locations of the bermed canal dredge spoil and the culvert referred to on page 42, end of 2<sup>nd</sup> paragraph, and elsewhere in this section.
  - o To what does the term "no fill" in the legend refer?
  - o The management summary (August 2003) had included a figure depicting three profile lines (A - A', B - B', C - C'), which, although not labeled as such, corresponded to groups of STUs on the Table that were to show representative soil profiles; this is not included in the report. In the management summary, it was initially confusing because they had not labeled the Table to match the group of profiles with the lines depicted on the figure. It would be helpful if this figure, with table revised as noted, were included in the current report.
- 64 - pp. 42 - 44: check references to Table numbers (e.g., should "Table 1" be Table 2, and "Table 2" be Table 3??)
- 65 - p. 44 and Figure 34:
  - o The STU numbers of the tests excavated around the borrow pit should be labeled on Figure 34; the text should also reference the STU numbers. Describe the artifact(s) found in the one positive shovel test, and the context in which it(they) were found.
  - o The proposed staging area should be labeled as such on the figure; the text should reference the STU numbers (are these SAI-SA3?).

**Comment 58**

**Response:**

See Comments 1 and 10 above.

**Comment 59**

**Response:**

See Comments 1 and 10 above.

**Comment 60**

**Response:**

See Comments 1 and 10 above.

**Comment 61**

**Response:**

See Comments 1 and 10 above.

**Comment 62**

**Response:**

See Comments 1 and 10 above.

**Comment 63**

**Response:**

See Comments 1 and 10 above.

**Comment 64**

**Response:**

See Comments 1 and 10 above.

**Comment 65**

**Response:**

See Comments 1 and 10 above.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

- page 45:

- 66 - o 1<sup>st</sup> paragraph, re: haul road: Again, it's not clear why Figure 26 is referenced here, as it does not provide a close-up view of the haul road, nor identify the locations of the three STUs (none of the figures appear to do so). The locations of the three STUs should be identified on a figure, and the text should reference the STU numbers.
- 67 - o Clarify that the discussion of artifacts identified (2<sup>nd</sup> – 5<sup>th</sup> paragraphs) pertains to Option 1 and Option 2 areas (if that is in fact the case?).
- 68 - o 2<sup>nd</sup> paragraph: Clarify issue of radial STUs, and whether or not additional prehistoric period artifacts were recovered (i.e., in the second to last sentence, does "these locations" refer only to N-2, Q-2, and V-2? See also discussion on page 46).
- 69 - o 4<sup>th</sup> paragraph: reference to Figure 36 should be Figure 37?
- 70 - o Last paragraph: On Figure 37, STUs R-0 and AC-0 are identified as part of a midden; this is inconsistent with the text which identifies the location of the midden only at STU S-0. Offer an interpretation of the numerous other locations where shell was found (i.e., cultural, non-cultural, etc.)
- Summary:
  - 71 - o P. 46: Should the prehistoric artifacts found in the AM series of STUs be considered part of Locus A of 7S-K-13?
  - 72 - o P. 47, last paragraph:
    - 2<sup>nd</sup> to last sentence, suggest clarification: "... (termed Locus S) representing a possible *previously unidentified* historic component of 7S-K-13."
    - last sentence: Clarify reference to "intact" Evesboro soils; report states that the material came from the plowzone.

**7.0 Visualization Study:**

**Intro section, p. 48:**

- 73 - - 1<sup>st</sup> paragraph: discuss proposed structure in comparison with the existing bridge.
- 74 - - Discussion of the approach should include additional information on how and why the locations were selected. See SHPO e-mail of October 24, 2003.

**7.1. Camera Location 1, p. 49:**

- 75 - - 1<sup>st</sup> full paragraph: Clarify statement about NRHP boundary vs. location of the station building itself. The current statement is confusing, particularly because there is no figure depicting the boundary.
- 76 - - 2<sup>nd</sup> paragraph: Whether or not visitors have access to the tower room is not the only issue to consider regarding visibility of the new bridge to and from the property.

**7.2. through 7.6: Camera Locations 2 through 6:**

See comments above regarding references to properties "in the vicinity".

**Comment 66**

**Response:**

See Comments 1 and 10 above.

**Comment 67**

**Response:**

See Comments 1 and 10 above.

**Comment 68**

**Response:**

See Comments 1 and 10 above.

**Comment 69**

**Response:**

See Comments 1 and 10 above.

**Comment 70**

**Response:**

See Comments 1 and 10 above.

**Comment 71**

**Response:**

See Comments 1 and 10 above.

**Comment 72**

**Response:**

See Comments 1 and 10 above.

**Comment 73**

**Response:**

See Comments 2 and 11 above.

**Comment 74**

**Response:**

See Comments 2 and 11 above.

**Comment 75**

**Response:**

See Comments 2 and 11 above.

*See previous page.*

*Comment 76*

*Response:*

See Comments 2 and 11 above.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

**8.0 Conclusions and Recommendations:**

- 77 - p. 51, 3<sup>rd</sup> paragraph: With regard the three residential properties JMA identified, no basis is given for the view that “none appeared National Register-eligible”. This was not an evaluation level survey. It would be appropriate to state that, should it later be determined that the project will affect these specific properties, a formal evaluation of their eligibility should be conducted. Same goes for the previously inventoried properties in this area (see above comments on Chapter 4), which are not mentioned in the conclusion section.
- p. 51-52: See above comments concerning results of the pedestrian survey.
- p. 52, 2<sup>nd</sup> paragraph: See above comments regarding conclusions derived from the geotechnical boring monitoring.
- 78 - p. 52, 3<sup>rd</sup> paragraph: Clarify statement “Other portions of the APE do not contain artifacts or significant deposits”. The term “significance” has a particular meaning in Section 106 and National Register of Historic Places; no evaluation was performed as part of this survey. As was done for the prehistoric artifacts, characterize the locations that contained historic artifacts and faunal material, but were excluded from Locus S (field scatter, isolated finds, sites, other loci of 7S-K-13, etc.?).
- p. 52, 4<sup>th</sup> paragraph: See above comments concerning the visualizations, and the inappropriateness of this document including statements regarding a specific finding of effect for the undertaking.
- 79 - Figure 46: There is no reference to this figure in the text. What is its purpose? Does it refer to areas that should be avoided in the wetland mitigation effort, or, if they can't be avoided, conduct a Phase II evaluation survey? This is also the first figure in the report which outlines a triangular area near the southeast end of the Option 1 wetland mitigation area. Is this the location of the proposed staging area discussed in Chapter 6? If so, it should be labeled as such.
- \* Need to add a brief discussion of the overall research design, assessing it's usefulness in terms of the research objectives.
- 80 - \* Given the thorough nature of the background research, and extensive data collection for the study area, can the consultant suggest changes to historic contexts and/or goals and priorities of the State Plans?
- 81 - \* Note location of the artifacts and supporting materials (forms, photographs, etc.) that JMA produced as a result of its survey.
- 82

**Appendices:**

**Appendix I: Cultural Resources Documentation**

- 83 - \* Need to provide an archaeological site form for 7S-K-13 Locus S (Note SHPO will update the original site form, and create forms for Loci A through R, including adding JMA's information to the form for Locus A).

**Comment 77**

**Response:**

See Comment 12 above.

**Comment 78**

**Response:**

See Comment 12 above.

**Comment 79**

**Response:**

See Comment 12 above.

**Comment 80**

**Response:**

This comment was addressed in the revisions to Section 8.0 in the Final CRMR.

**Comment 81**

**Response:**

This comment was addressed in the revisions to Section 5.0, with a new Section 5.1 in the Final CRMR.

**Comment 82**

**Response:**

See Comment 10.

**Comment 83**

**Response:**

A site form for 7S-K-13 Locus S will be included with the Final Management Report.

Jan. 30, 2004 DE SHPO Comments: IRIB revised cultural resource management report

**Appendix II: Cultural Resources Data Inventory:**

- 84 - There are properties for which the "Listed" field is blank; since a CRS # is given, presumably the properties should have at least been identified as inventoried (INV). Or does there need to be another category, such as "unknown"?
- 85 - In the key pages at the beginning of the Appendix, to what does LUT refer?
- p. 33 lists "S-6049.001B" as the Fire Control Tower, but the maps indicate that the CRS number for the Tower that is within the Study Area is S-6049.2.
- See also Primary Technical comments above.

**Appendix III: Artifact Inventory:**

- 86 - See comment above regarding the need to identify (in text and graphics) the STUs in the borrow pit area. Is the positive test pit included in the artifact inventory (? possibly Lot 55, STU BP-29, but since there were only 17 STUs....?)?

**\*Note:** Asterisked items are those which need to be addressed to meet applicable sections of the federal and state standards and guidelines (background research and Phase I identification level survey).

**Comment 84**

**Response:**

See Comment 23 above.

**Comment 85**

**Response:**

See Comment 23 above.

**Comment 86**

**Response:**

See Comment 68 above.



STATE OF DELAWARE  
DIVISION OF HISTORICAL AND CULTURAL AFFAIRS  
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March 17, 2004

Ms. Therese M. Fulmer, Manager  
Environmental Studies  
Delaware Department of Transportation  
800 Bay Road, P.O. Box 778  
Dover, DE 19904

RE: Indian River Inlet Bridge Replacement Project (Bridge 156, carrying SR 1 over Indian River Inlet), Sussex County, Delaware; State Contract Number 23-073-03; Federal Aid Project Number BROS-S050(7); Draft Environmental Assessment and Nationwide 4(f)/6(f) Evaluation Revised; consultant response to SHPO comments on Cultural Resource Management Document

Dear Ms. Fulmer:

Enclosed please find our written comments on the Draft Environmental Assessment (EA) and 4(f)/6(f) Evaluation. We are primarily concerned with ensuring that the document contains the most accurate, up to date information on cultural resources in the Area of Potential Effect (APE) and on the Section 106 consultation. We think the current document requires significant clarification regarding these issues; some of our concerns are similar to those expressed in our comments on the revised Cultural Resources Management report (January 30, 2004).

Our comments on the Draft EA also refer to other correspondence, i.e., SHPO e-mail and letters of October 2003, and SHPO comments on the previous Corps permit for DNREC's artificial reef number 10. These documents are enclosed for your convenience.

We would also like to take this opportunity to discuss the response to our comments on the revised Cultural Resources Management report. We received the response on February 26, 2004, and discussed it informally during the March 3, 2004, field meeting. The response addressed the majority of our main concerns with the report. We did however note a few minor technical issues, as follows:

The final report should address all aspects of the project, e.g., mention whether or not the survey covered the locations affected by the utilities relocation, upland habitat restoration, and off shore reef habitat enhancement, and if not why no further investigation is necessary.

*Comment 1*

*Response:*

The Final report will address all aspects of the project as requested.

Letter to T. Fulmer  
March 17, 2004  
Page 2

- 2 - In Section 7, regarding Camera Location 6, reference to the White House Farm should indicate that the property *may be eligible* for the National Register. [To clarify Gwen Davis' previous discussion with the consultant about this property, a nomination for the White House Farm (S-202) was submitted to the Keeper of the National Register of Historic Places in the late 1970s, but after several rounds of comments from the Keeper, and our office's attempt to address them, the nomination was eventually withdrawn in 1982. However, it is possible that, if the property were to be reevaluated in consideration of historic contexts that have been developed since the initial review, the property *could be determined eligible*.]
- 3 - In Conclusions/Recommendations, reference to National Register listed properties, the NR listed Wilgus Site (S-686) is an archaeological site, not an architectural resource.

4 We acknowledge that the response was provided to address those issues we identified as primary concerns, particularly those relating to meeting the federal and state standards and guidelines. The response did not necessarily address other technical comments, even though some of these items are within the same sections that were included in the response. We trust that these items will be addressed in the final report.

Thank you for your consideration of these comments. We look forward to hearing about the results of additional archaeological investigations conducted for the Fresh Ponds wetland mitigation area, and the status of development of the wetland mitigation plan. In the interim, if you have any questions, please do not hesitate to contact us.

Sincerely,



Donald R. Griffith  
Director/State Historic Preservation Officer

Enclosures

- cc: Robert Kleisburl, Safety & Environmental Specialist, Federal Highway Administration
- Richard Bessel, Chief, Application Section I, Philadelphia District, U.S. Army Corps of Engineers
- Michael C. Mahr, Senior Highway Planner, DHDOT (w/enclosures)
- Kevin Cunningham, Archaeologist, DHDOT (w/enclosures)
- Cara Blum, Cultural & Recreational Services Section, Parks & Rec., DHRBC (w/enc.)
- Thomas Hill, Manager, Water Resources Division, Bonomet, Klappert & Kahl (w/enc.)
- Wade Catta, John Miller Associates, Inc. (w/enclosures)

**Comment 2**

**Response:**

The Final Cultural Resource Management Report (CRMR) will explain the eligibility status of White House Farm as requested.

**Comment 3**

**Response:**

The Final CRMR will reference the NR listed Wilgus Site (S-686) as an archaeological site as requested.

**Comment 4**

**Response:**

The Final CRMR will address the other technical comments provided by the SHPO on January 29, 2004, as requested.

March 17, 2004

**Indian River Inlet Bridge Project: DE SHPO Comments on the  
DRAFT Environmental Assessment and Nationwide 4(f)/6(f) Evaluation**

III.C.5. Comparison of Impacts for Alternatives...

Pages 19-20: Add discussion of how cultural resources were considered in the alternatives analysis for the park access roads.

IV.C. Cultural Resources (pp. 37-40):

Page 37, 3<sup>rd</sup> paragraph:

- 2<sup>nd</sup> sentence: Additional studies were conducted based on comments from both DelDOT and DE SHPO
- last sentence: Clarify reference to the Area of Potential Effect (APE) and the extent of the cultural resource survey. DelDOT defined the APE for the undertaking as the 5-mile radius around the Bridge. The pedestrian survey was limited to the anticipated Limits of Construction for the bridge construction and park roads reconfiguration; delete the reference to "APE" in the part of the sentence referring to pedestrian survey.
- last sentence: Specify what the visualizations were of and their purpose (i.e., visualizations of the view to the proposed new bridge, from locations selected to be representative of the view from known resources; the visualizations were from various angles and distances from the proposed new bridge.)

Pages 38 and 39:

- Table 7, Summary of 326 Cultural Resources in the 5-Mile Radius of Existing Bridge: The information in this Table is not accurate; please refer to our January 30, 2004, comments on the draft cultural resources report. It is also not clear what is meant by the phrase "Eligible or recommended in draft version" (1<sup>st</sup> column, 2<sup>nd</sup> row). Perhaps the phrase "Determined eligible, or recommended as potentially eligible" would suffice?
- 1<sup>st</sup> paragraph, last sentence: The SHPO's comments were clearly in reference to archaeological survey, only.
  - a. Archaeological Resources:
    - o 1<sup>st</sup> paragraph: See above comment regarding reference to the APE; sentence needs clarification, as well, e.g., "Pedestrian survey of the LOC for the bridge replacement and park access roads was conducted; no archaeological evidence of prehistoric or historic period use of the landscape was observed."
    - o 2<sup>nd</sup> paragraph: See our January 30, 2004, comments on the draft cultural resources report, and DHA's response thereon, re: clarification of interpretation of the results of the monitoring at the bridge pier locations, and examination of results of other borings in the vicinity. Also, 2<sup>nd</sup> sentence, "... borings were monitored for evidence of prehistoric activity...".
    - o 3<sup>rd</sup> paragraph: Update to reflect the current situation. It has not yet been determined if any additional "loading, monitoring or pre-construction requirements are needed" or not, as the wetland mitigation plan is still evolving. However, it seems likely that "pre-construction requirements" would be needed, in the form of specific measures taken to ensure that the identified sites are not affected. What information is included in the final EA will depend on the results of DHA's current investigations, and the status of the development of the wetland mitigation plan.

**Comment 5**

**Response:**

Discussion of how cultural resources were considered in the alternatives analysis for the park access roads will be added to Section III.C.5.

**GENERAL NOTE REGARDING SECTION IV.C. CULTURAL RESOURCES:**

**The Cultural Resources Section of the Environmental Assessment has been substantially rewritten in order to improve its consistency with the other sections of the document, to update the relevant investigations and findings, and to address the comments provided by the SHPO.**

**Comment 6**

**Response:**

This comment not applicable because section has been substantially rewritten.

**Comment 7**

**Response:**

DelDOT defined its Study Area for cultural resources as a 5-mile radius. The Area of Potential Effect (APE) for archeological sites is defined as the limit of disturbance for the proposed project including all the mitigation components. The APE for architectural resources is defined as the 5-mile radius. These definitions are clarified in the revised section.

**Comment 8**

**Response:**

This comment considered in the rewriting of Section IV.C.2.b.

**Comment 9**

**Response:**

Table 7 not included in the revised section. This comment considered in the rewriting of Sections IV.C.1.a and IV.C.2.a.

**Comment 10**

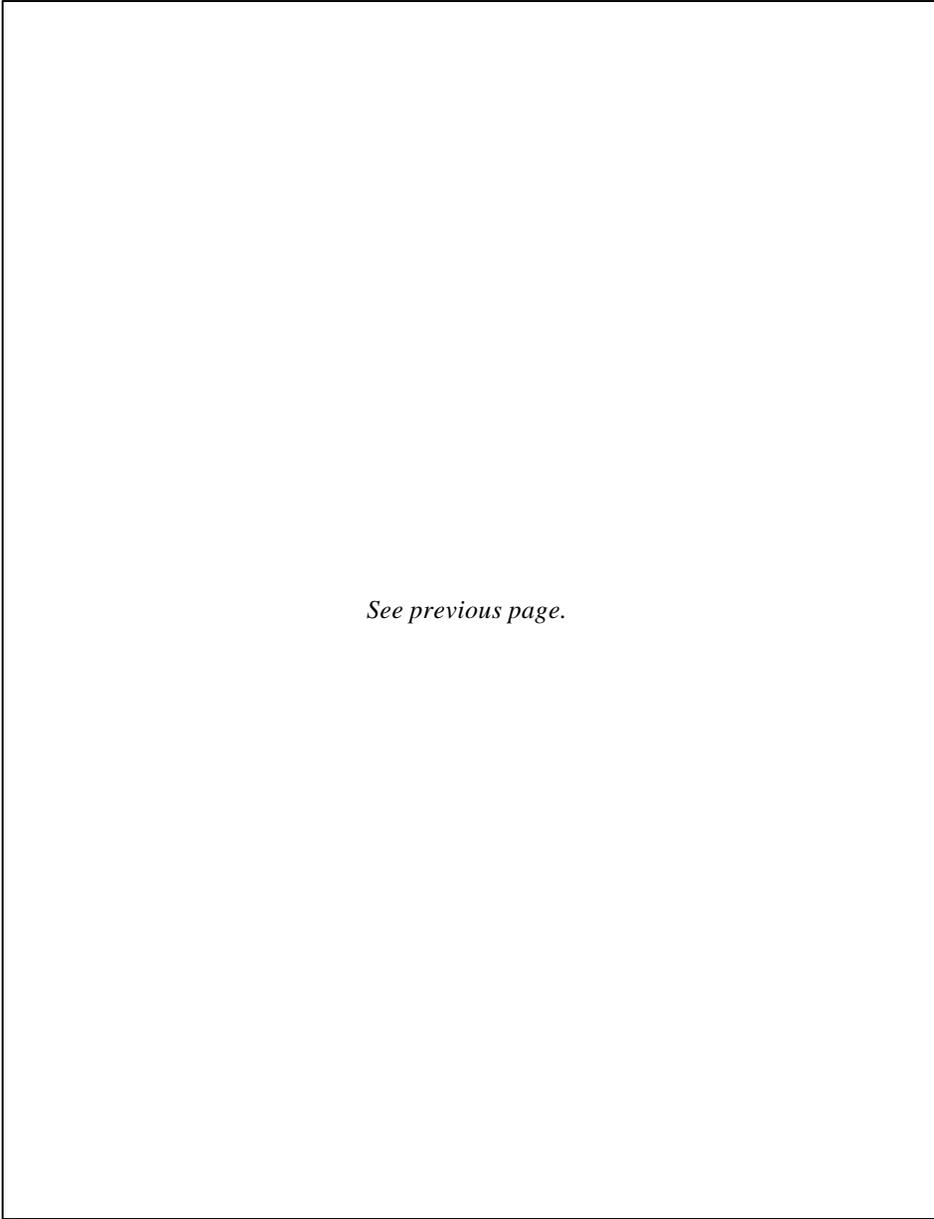
**Response:**

This comment not applicable because section has been substantially rewritten.

**Comment 11**

**Response:**

This comment considered in the rewriting of Section IV.C.1.a.



*See previous page.*

***Comment 12***

***Response:***

This comment considered in the rewriting of Section IV.C.1.a.

***Comment 13***

***Response:***

The section has been rewritten to reflect investigations and findings proposed to date. At this point, all cultural resource investigations for all areas considered for mitigation sites are complete.

3/17/04 IRIB: DE SHPO comments on draft EA and 4(f)/6(f) evaluation page 2

b. Architectural Resources:

- o See our January 30, 2004, comments on the draft cultural resources report, and JMA's response thereto, regarding the nature of known properties (inventoried and NR listed or eligible) within the APE, and the characterization of the results of the visualizations.
- o In general, this section lacks clarity and draws conclusions that are premature. The discussion is inconsistent on the subject of whether or not the bridge might be visible to known or potential historic properties, and includes statements that are internally contradictory (e.g., 1<sup>st</sup> paragraph, last sentence) or are simply not clear. It is not true that the bridge would not be visible to any inventoried property; e.g., one can clearly see the existing bridge (which is significantly smaller than the proposed structure) from the White House Farm on the north shore of Indian River. Additionally, the discussion of a specific finding of effect was premature. As of the writing of this draft EA, or to date for that matter, a formal finding of effect has not yet been documented, and would also have to consider the entire undertaking (i.e., the archaeological issues have not been completely resolved). What information is included in the final EA will depend on the status of consultation with the SHPO on the issue of effects (visual and otherwise), including the status of the development of the wetland mitigation plan. The SHPO will provide comments on the complete undertaking and its potential effects once the issue of the wetland mitigation sites is resolved.
- o 6<sup>th</sup> paragraph: The SHPO has commented on the level of effort taken to identify historic properties (see, e.g., verbal comments at Jan. 14, 2004 DeltDOT/SHPO meeting, and written comments of Jan. 30, 2004). As noted above, the effort to identify archaeological sites is not yet complete.

Page 35, IV.C.2. Consequences:

See above comments on the inappropriateness of statements made concerning the finding of effect, and on the status of SHPO review of the cultural resources survey report.

Page 40, IV.D. Conclusion:

Table 8: At this time, the listing of "No" Potential Impacts (Adverse Effects) to Cultural Resources is premature, particularly with regard to archaeological sites. The question of effects on historic properties should be resolved before Table 8 is finalized for completion of the EA.

V. Comments and Coordination

Page 43, Table 9:

- August 11, 2003, reference to DE SHPO letter: Subject should read Purpose and Need Comment
- October 28, 2003, reference to DE SHPO, re next steps for Section 106 process: Our Oct. 28 letter is not included with the correspondence in Appendix C; only our Oct. 23 e-mail is there; both would seem relevant. We also sent an e-mail on Oct. 24, which should be included. These documents are attached for your convenience.

**Comment 14**

**Response:**

This comment considered in the rewriting of Sections IV.C.2.a. and b.

**Comment 15**

**Response:**

This comment considered in the rewriting of Section IV.C.2.b. At this point, all cultural resource investigations for all areas of the project are complete.

**Comment 16**

**Response:**

All cultural resource investigations for all areas of the project are complete.

**Comment 17**

**Response:**

All cultural resource investigations for all areas of the project are complete.

**Comment 18**

**Response:**

Table 9 is updated in Chapter 5.0 of the Final Environmental Assessment and Nationwide Section 4(f)/6(f) Evaluation. The citation is changed as requested.

**Comment 19**

**Response:**

Table 9 is updated in Chapter 5.0 of the Final Environmental Assessment and Nationwide Section 4(f)/6(f) Evaluation. The citations are added as requested, and the letters appear as the attachments to this comment letter (see below).

3/17/04 IRIB: DE SHPO comments on draft EA and 4(f)/6(f) evaluation page 3

Appendix A: Section 4(f)/6(f) Evaluation

Page 9, Section IV.E. Cultural Resources within DNREC Properties:

- The title seems misleading, as such an evaluation would apply to any "takes" or "uses" of a 4(f) property, whether or not it was owned by DNREC.
- See above comments on Section IV.C. of the main report, but note specifically:
  - o It has not yet been determined if there will be any direct effects on archaeological sites; the question is whether or not FHWA would view such sites as 4(f) properties.
  - o Status of SHPO review of the cited cultural resource survey report.
  - o Inappropriateness of statements made concerning the finding of effect.

Appendix B: Compensatory Mitigation Plan

General:

Note that several aspects of this Plan, i.e. those beyond the wetland mitigation efforts, were not mentioned in the cultural resource section of the EA, or in the cultural resource survey report. Both of these documents should include, in particular, a discussion of potential effects to historic properties (or lack thereof) from the upland habitat restoration and the off shore reef habitat enhancement. With regard to the latter, it is our understanding that the concrete materials of the existing bridge would be disposed of at an already established artificial reef, specifically Site Number 10. In 1994 and 2000, DE SHPO reviewed a series of locations proposed by DNREC for creation of such reefs, including the subject location. These reviews culminated in findings of No Adverse Effect, conditioned on clear demarcation and avoidance of areas likely to be significant archaeological sites. The specific conditions of our concurrence are outlined in a letter to the Corps of Engineers, dated March 8, 2000 (enclosed). These same conditions would apply to the Indian River Inlet Bridge project.

Page 3, 4<sup>th</sup> paragraph:

As expressed at the 3/3/04 field meeting, and 3/4/04 joint agency meeting, DeDOT should make clear that any modifications made at the recommendation of the environmental compliance monitor will remain within the established LOC, which (thus far) has been delineated to avoid effects on archaeological sites.

Attachment A - Offsite Wetland Creation Site Search Report, page 6:

Update information on locations considered, and the status of cultural resource (archaeological) investigations and consultation with SHPO and DNREC.

Appendix C: Consultation and Coordination

See comments on Section V. of the main report.

**GENERAL NOTE REGARDING APPENDIX A—SECTION 4(f)/6(f) EVALUATION:** Section IV.E. now appears as Section III.B. in the revised Section 4(f)/6(f) Evaluation.

*Comment 20*

**Response:**

The title of Section III.B. is "Cultural Resources."

*Comment 21*

**Response:**

Section III.B. will be updated with cultural resources conclusions for final publication. At this point, all cultural resource investigations for all areas of the project are complete.

**GENERAL NOTE REGARDING APPENDIX B—COMPENSATORY MITIGATION PLAN:** The Compensatory Mitigation Plan will be substantially rewritten prior to the publication of the Final Environmental Assessment in order to address recent environmental investigations including additional cultural resources investigations.

*Comment 22*

**Response:**

Reference to the agreement between the SHPO and the U.S. Army, Corps of Engineers, and its conditions will be added to the discussion of the out-of-kind deep water enhancement opportunity.

*Comment 23*

**Response:**

This comment considered in the rewriting of Section IV.C.1.b. Also, the limitations of the environmental monitor (that is, to allow use of designated "Avoidance Areas") will be described in Appendix B.

*Comment 24*

**Response:**

The offsite wetland creation site search report (Attachment A) will not be revised. Because it is very general, it is still applicable. The Fresh Pond Management Summary provides the relevant cultural resources studies updates.

Davis Gwen (DOS)

**From:** Davis Gwen (DOS)  
**Sent:** Friday, October 24, 2003 4:09 PM  
**To:** 'Thomas M. Heil, P.E.'; Griffith Daniel R (DOS)  
**Cc:** 'Katy Harris'; 'theil@zeus.rkengineers.com'; Fulmer Terry (DelDOT); Hahn Michael (DelDOT); O'Shea Dennis (DelDOT); 'wcatts@johnmilnerassociates.com'; 'Rick Meyer'; Cunningham Kevin (DelDOT)  
**Subject:** RE: IRIB - Status Update and Visual Assessment Sample Report Request

Tom et al,  
 Attached please find our suggestions for describing the approach taken and the materials developed for assessing visual effects. Some of the information (noted in brackets [ ]) can wait for the formal effects documentation. Also, examples and guidance that are noted as "attached" will be sent with the hard copies of the memo. In the meantime, if you have any questions, please contact Dan or me. Thanks.  
 -- Gwen

-----Original Message-----

**From:** Davis Gwen (DOS)  
**Sent:** Thursday, October 23, 2003 11:26 AM  
**To:** Thomas M. Heil, P.E.; Griffith Daniel R (DOS)  
**Cc:** 'Katy Harris'; 'theil@zeus.rkengineers.com'; Fulmer Terry (DelDOT); Hahn Michael (DelDOT); O'Shea Dennis (DelDOT); 'wcatts@johnmilnerassociates.com'; Rick Meyer; Cunningham Kevin (DelDOT)  
**Subject:** RE: IRIB - Status Update and Visual Assessment Sample Report Request

Tom et al,  
 Here are our thoughts on the next steps for the Section 106 process for this project:

What we need now:

- Archaeology: Management Summary describing Phase IB archaeological investigations, including:

- (1) Results of the monitoring of soil borings done at the abutment locations.
- (2) Results of the field work at the wetland mitigation area, revised to include most recent additional testing and reconnaissance, including borrow pit areas.
- (3) Discussion of any reconstructions (existing?) done in areas to be affected by the construction of the main road (aligned alignment) and secondary access roads. Also, please check into the impending geotechnical investigations (DelDOT letter to Corps of Engineers dated October 7, 2003), to see if any of these areas have been (or need to be) reviewed by JMA, and if the results of those investigations have been (or will be) made available to JMA.

- Above-ground resources: Written description of:

- (1) The approach taken to identify historic properties and potential visual effects thereon;
- (2) Description of the six locations used to illustrate the views to the new bridge, and why these locations were selected (i.e., representative of views from known and potential historic properties, at various distances from the proposed new bridge and within the project APE). This information is necessary to supplement the map and photographic visualizations we have already received, to assist in assessing potential visual effects. Under separate cover, we will provide a summary of information that should be included, as well as a copy of DRAFT guidance we are developing on assessing visual effects.

What we'll need in the future to complete the Section 106 process:

- Formal assessment of effect, and documentation thereon. Note - in our view, assuming archaeological sites identified to date or that may be present in the project LUC are avoided, the most likely finding would be No Adverse Effect, requiring documentation following 36 CFR Part 800.11(e).

10/24/2003

October 24, 2003

**Indian River Inlet Bridge Project: DE SHPO suggestions for information on potential visual effects**

**Note:** Statements in [ ] indicate materials that do not need to be provided immediately, but should be included in the formal assessment of effects documentation.

1. Describe the approach taken to identify historic properties and potential visual effects thereon, for example:
  - JMA Phase IA background research;
  - Field meeting of May 19, 2003; DE SHPO suggestion to follow protocols established for cell tower projects, either using balloon test or 2 mile radius (standard for 100 foot tall towers) as means of establishing the Area of Potential Effect (APE);
  - DelDOT decision to use 5 mile radius as APE; agreement w/SHPO to only collect baseline CRS data (no new survey) within that area, and for DelDOT to provide visualizations of views to proposed bridge structure, from representative angles and distances relating to the locations of known and potential historic properties.
  - Consultants collected data and suggest 13 locations from which to demonstrate appearance of bridge; consultation w/SHPO narrows number down to 6, due to duplication of representative views from known and potential historic properties, at various distances and angles from the proposed new bridge, within the project APE.
  - Include labeled map, identifying the selected locations.
2. Description of the six locations used to illustrate the views to the new bridge, note for each:
  - Approximate distance and direction from proposed bridge site;
  - Description of known and potential above-ground resources in vicinity of the location (e.g., location 1, vicinity of NR listed Indian River Life Saving Station) for which the view is supposed to be representative. It is understood that for some of the locations, these isn't a particular property, but was chosen to represent the view from a number of resources in that general vicinity; in these instances, just give a general characterization of the properties. [Include photos of properties; see attached examples].
  - Description of the view from the location to the bridge, e.g., degree of visibility. [Include the visualizations already submitted, but add captions identifying location and representative properties from which the views were taken; see attached examples].
3. Application of the criteria of adverse effect; examples 36 CFR Part 800.5(a)(2)(iv) & (v), and discussion of why we or are not applicable to the historic properties, as represented by each of the 6 locations. See attached DRAFT DE SHPO guidance, "Assessing Visual Effects on Historic Properties" for further guidance on approaches to describing visual effects and the nature of those effects. Note: we welcome comments on this DRAFT.



STATE OF DELAWARE  
DEPARTMENT OF STATE  
DIVISION OF HISTORICAL AND CULTURAL AFFAIRS  
HISTORIC PRESERVATION OFFICE  
15 THE GREEN  
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TELEPHONE: (302) 739-5665

FAX: (302) 739-5660

October 28, 2003

**MEMORANDUM TO:** Therese M. Fulmer, Manager, Environmental Studies, DelDOT

**FROM:** Gwenyth A. Davis, Archaeologist *DAD*

**SUBJECT:** Indian River Inlet Bridge (Bridge 156); visual effects guidance

Attached please find a hard copy of the guidance we provided to you by e-mail on October 24, 2003. The guidance lists information that we suggest DelDOT provide in order to assist with assessing the potential visual effects of the undertaking on historic properties. The attachment includes examples of photographs with captions and other graphic representations derived from cell tower projects, which were not attached to the original e-mail.

Also included is a copy of our DRAFT guidelines "Assessing Visual Effects on Historic Properties". Our staff has developed these guidelines to provide guidance for DE SHPO staff, agencies, applicants, and others in assessing visual effects on historic properties. The document explains the policy of the DE SHPO and outlines the issues involved in assessing visual effects. This document is still in DRAFT form. We welcome any comments you or your staff may have, particularly whether or not you found the guidance helpful for the Indian River Inlet Bridge project.

We look forward to seeing the information pertaining to potential visual effects of the project, and also the archaeological management plan (as noted in our e-mail of October 23). In the meantime, if you have any questions, please do not hesitate to contact me, or Dan Griffiths. Thank you.

**Enclosures:**

cc (all email): Michael C. Hahn, Senior Highway Planner, DelDOT  
Patrick Carpenter, Historian, DelDOT  
Tom Hill, R.E., Rummer, Klepper, & Kohl  
Kathy Harris, Rummer, Klepper & Kohl  
Rick Meyer, John Miller Associates  
Wade Cain, John Miller Associates



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March 8, 2003

Mr. Edward E. Bonner  
Project Manager  
Regulatory Branch, Philadelphia District  
Corps of Engineers  
100 Penn Square East  
Philadelphia, PA 19107-3390

Dear Ed:

This letter is pursuant to our receipt and view of the Public Notice (CENAP-OP-R-199902977-1) for DE DNREC's proposed continuation of their Artificial Reef Program to maintain and enhance fisheries habitat in the Delaware Bay and Atlantic Ocean. The intent of this proposed permit is to authorize DNREC to continue the same activities, with some modifications, previously authorized under Permit # CENAP-OP-R-199400886-1, for which your agency completed its Section 106 compliance responsibilities.

Based on our review of this Public Notice and the results of the 1994 underwater archaeological survey as reported in *Phase I Marine Cultural Resources Report for Proposed Artificial Reef Sites in Delaware Bay and the Delaware Atlantic*, by Clifford and Capone, there are five (5) submerged anomalies identified within and immediately adjacent to the project Area of Potential Effect (APE) which have the configuration and character to be significant archaeological sites. We are of the opinion the types of activities being proposed, by their nature, have the potential to cause physical destruction of or damage to all or part of these historic properties, which pursuant to 36 CFR 800.5(a)(2)(a)(i) of the Advisory Council on Historic Preservation's regulations constitutes an adverse effect. However, as with our prior consultation, there is the opportunity to place restrictions on the proposed construction activities that would satisfactorily avoid incurring this adverse effect. The permit would have contain the following conditions: When construction is proposed at Reef Sites 2, 4, and/or 10, the associated anomalies will be identified prior to the initiation of construction using the Loran C coordinates identified in the above survey report. These anomalies will be delineated by navigational buoys. For anomalies less than 10 meters in size, a single buoy can be used. For those anomalies over 10 meters in size, the perimeter of the anomaly will be marked with a series of navigational buoys. The identification and delineation of each anomaly will occur no more than 24 hours prior to the

Letter to Bonner  
March 8, 2000  
Page 2

initiation of construction and must be re-established if work extends beyond that 24 hour period. Their location may have to be re-established if storm or extreme tide events arise after their initial delineation. **No construction work may occur within 250 meters of the perimeter of an anomaly.** Assurance of this can be achieved either with the use of additional navigational buoys, with the above noted time restrictions or by employing either a DNREC or independent inspector to oversee and approve the deployment activities. That inspector would be charged with ensuring the buffer is established and maintained throughout the deployment of reef materials. **These avoidance measures will apply to Reef Sites 2 Anomalies 2-1 and 2-2; Reef Site 4 Anomaly 4-1 and Reef Site 10 Anomalies 10-1 and 10-2.** Finally, Anomalies 2-2 and 10-2 are located immediately outside but adjacent to the reef site boundary. If extant construction plans require at least a 50 meter setback to contain or confine work within a reef site boundary, this construction restriction will satisfy our avoidance concern and can used instead of the 250 meter buffer cited above.

With these conditions placed on the DNREC's permit to construct Artificial Reefs, we can concur with a No Adverse Effect determination, pursuant to 36 CFR 800.5(b) of the Council's regulations. By this letter we thereby conclude the Section 106 consultation for this undertaking unless the project is modified; thus, obligating your agency to reopen consultation with this Office.

If you have any questions or require any additional assistance, please do not hesitate to contact me at your convenience. Thank you.

Sincerely,

  
Faye L. Stocum  
Archaeologist

cc: Jeff Tinsman  
Laura Herr  
Jim Hewes

March 8, 2004

Mr. Dennis O'Shea  
Assistant Director, Design  
DelDot  
800 Bay Road  
Dover, De. 19901

Dear Mr. O'Shea,

In response to receipt of the Draft Environmental Assessment for the Indian River Inlet Bridge new construction, I, as a participant in the public process, would like to indicate that the Draft Assessment is thorough, particularly in fully indicating the pros and cons of the proposed alignment and anticipated consequences.

Following are my comments regarding 4.0, Environmental Resources and Consequences:

- 1 | 1. With the permanent reduction of State Parkland and indication of the potential gain of one acre by the vacating of DelDot land, ask the assurance to the public that this transfer will be at no cost to DNREC.
- 2 | 2. Pg. 25: Vehicle speed should remain at 55 miles/hr. Written agreement that concrete plant will be temporary. Area used restored. Hours of operation scheduled to permit continued use sampling area.
- 3 | 3. Pg. 28: In spite of the LOS F potential for the left-turn movement, recommend no consideration of a signal.
- 4 | 4. Pg. 31-40: There must be a long-range plan that indicates restoration to greatest degree possible of loss of wetlands and habitat. The "Several natural communities of conservation concern" must be honored and the Delaware Natural Heritage staff expertise utilized to the utmost.
- 5 |

Sincerely,  
*Melvin Grankis*  
Melvin Grankis



Delaware Department of Transportation  
1415 Southborough Ave.  
Hartwood Beach, DE 19971

**Comment 1  
Response:**

The land DelDOT has agreed to vacate to DNREC will result in a change of ownership of the land at no cost to DNREC. Included in the land DelDOT will be vacating for DNREC is the roadbed of existing SR1 immediately north of the existing Indian River Inlet Bridge. This land will be converted into sparsely vegetated upland habitat, which will provide habitat for resident and migratory bird species for purposes of nesting and foraging. In addition DNREC and the Delaware Seashore State Park will receive improvements to the park from DelDOT as a result of the project.

**Comment 2  
Response:**

The posted speed limit for SR 1 upon completion of the improvements will remain 55 miles per hour.

**Comment 3  
Response:**

The concrete batch plant will be temporary and is being constructed for specific use for the duration of construction of the project. The area for the temporary concrete batch plant will be limited to the existing northern RV campground and will be restored upon completion of the project. The operating hours of the concrete batch plant will be limited to day time hours. However, if and when the operation would continue into the nighttime hours DelDOT noise procedures and protocols will be followed.

**Comment 4  
Response:**

The preferred alternative does not include the installation of traffic signals to SR 1 at the park access roads. (Please refer to Section III.C.4)

**Comment 5  
Response:**

DelDOT in cooperation with DNREC and the other regulatory agencies has assembled a compensatory mitigation plan (CMP) for the project, which is consistent with the no net loss of wetlands policy and provides replacement for unavoidable aquatic resources and upland habitats. DelDOT has been committed to continued coordination with the DNREC which will continue throughout the duration of the project.