ENVIRONMENTAL PROTECTION
LAND USE MANAGEMENT
COASTAL MANAGEMENT OFFICE
Adopted New Rules: N.J.A.C. 7:7-7.30 and 7.31
Adopted Amendments: N.J.A.C. 7:7-1.3, 2.1, 2.3, 4.2 and 7.2; 7:7E-3.38, 3.49, 3C.2, 7.4, 7.14 and 8.12; and 7:13-7.1 and 7.2

Proposed: September 8, 2009 at 41 N.J.R. 3168(a)

Adopted: by Bob Martin, Commissioner, Department of Environmental Protection

Filed: as R. , **with substantive and technical changes** not requiring additional public notice and comment (see N.J.A.C. 1:30-6.3)

Authority: N.J.S.A. 12:3-1 et seq.; 12:5-3; 13:1D-1 et seq.; 13:9A-1 et seq., 13:19-1 et seq.; 13:20-1 et seq.; 23:2A-1 et seq.; 58:10A-1 et seq.; 58:11A-1 et seq.; and 58:16A-50 et seq.

DEP Docket Number: 12-09-08/734.

Effective Date:

Expiration Date:

The Department is adopting new rules and amendments to facilitate review and construction of renewable energy facilities in appropriate locations in the coastal area. These new rules and amendments include new coastal general permits and permits-by-rule to address the regulation and permitting of wind turbines and solar energy facilities. Specifically, the Department is amending the Coastal Permit Program rules to add a new permit-by-rule and two new coastal general permits for the construction of wind turbines on land; add a new permit-by-rule for the construction of solar panels; and describe the situations in which construction of a wind turbine or solar panel does not require a coastal permit. The Department is also adopting amendments to the Coastal Zone Management rules, N.J.A.C. 7:7E, to facilitate the construction of wind turbines in the coastal zone in appropriate locations, identify particular areas where construction of large scale wind turbines would not be appropriate, and set forth monitoring, habitat evaluation and impact

assessment requirements for birds, bats and marine organisms. The amendments adopted herein also allow the construction of a demonstration wind energy facility in the ocean waters of the State to assist in assessing the impacts of such a facility. In addition, the Department is adopting amendments to the Flood Hazard Area Control Act Rules, N.J.A.C. 7:13, to add a new permit-by-rule for the construction of wind turbines on land.

The proposal to amend the Coastal Permit Program Rules, the Coastal Zone Management Rules and the Flood Hazard Area Control Act Rules was published in the New Jersey Register on September 8, 2009 at 41 N.J.R. 3168(a). A public hearing was held on October 14, 2009. The comment period for the proposal was initially scheduled to close on November 7, 2009. However in response to a request from commenters, the Department extended the comment period by 30 days to Monday, December 7, 2009 when the comment period closed.

On January 20, 2010, Governor Christie issued several executive orders. Executive Order No. 1 suspended for 90 days more than 150 then-pending proposals of various New Jersey agencies, among which was the proposal to amend the Coastal Permit Program Rules, the Coastal Zone Management Rules and the Flood Hazard Area Control Act Rules adopted at this time as well as 11 other proposals of the Department. Executive Order No. 1 states that one of the Governor's priorities is to establish, under the direction of a Red Tape Review Group, a “commonsense” approach to the promulgation of rules. The commonsense principles are described in Executive Order No. 2, and the Red Tape Review Group is established under Executive Order No. 3. The purpose of the suspension was to afford the Red Tape Review Group the opportunity to examine the suspended rulemakings and make recommendations as to those proposed rules it determines are "unworkable, overly-proscriptive or ill-advised.”

On February 3, 2010, the Department filed for publication in the New Jersey Register a notice extending or reopening the comment period on the proposal being adopted at this time and the other 11 suspended Department rulemakings to March 15, 2010. The notice appeared in the March 1, 2010, New Jersey Register (see 42 N.J.R. 642(a)). The Department posted the notice on its website on February 4, 2010. The Department sought through the notice to focus any additional written comments submitted on the

purposes of the rules review set forth in the executive orders. The Department also announced in the notice that it would be scheduling informal stakeholder meetings on the proposals and that the dates for the meetings would be posted on the Department's website. The schedule of the stakeholder meetings was subsequently posted on the website on February 22, 2010.

On March 8, 2010, the Department held an informal meeting in the Department of Environmental Protection's Public Hearing Room pursuant to the Governor's Executive Orders No. 1, 2 and 3 to allow any interested stakeholders or members of the public to discuss the proposed new rules and amendments relating to wind and solar energy facilities. Approximately 50 people attended the meeting.

At the meeting, the Department and interested stakeholders discussed the proposed new rules and amendments in consideration of the topics outlined in the Governor's Executive Orders No. 1, 2 and 3. Stakeholders supported the amendments and new rules relating to solar energy and requested that the Department move quickly to adopt the solar energy related provisions. In general, stakeholders supported the tiered approach to regulation and indicated that the new rules and amendments streamline the permitting process through the exemption of certain wind turbines and the addition of a permit-by-rule and general permits. However, some stakeholders disagreed with the Department's thresholds for the permit-by-rule and general permits indicating that such thresholds should be increased to allow more turbines to be subject to the streamlined permitting process. Stakeholders also commented that the monitoring requirements set forth in the Department's Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits are too costly. Some stakeholders supported the science used in developing the rule, the Large Scale Wind Turbine Siting Map and the technical manual and indicated that the Map and technical manual add predictability and transparency to the permitting process. Stakeholders also noted that other tall structures, such as high-rise buildings and other towers, impact birds and bats to a greater degree than wind turbines and that the Department should adopt regulations addressing such structures. Some also felt the rules did not take into consideration the positive impacts of reducing fossil fuel use by installing renewable energy facilities. With respect to offshore

wind turbine development, stakeholders indicated that the Department's requirements and regulatory process are less burdensome than the current Federal process for Federal waters. However, stakeholders also noted that there are issues surrounding the proposed permitting and monitoring requirements and the ability of a wind developer to obtain financing. It was suggested that the Department look at all Department rules with respect to how they could facilitate development of renewable energy facilities. Lastly, questions were raised as to how the Department will conduct detailed and complex cost benefit analyses.

In response to public comment, the Department has made several changes on adoption. These changes are described below in responses to comments and in the Summary of Agency-Initiated Changes.

Summary of Hearing Officer's Recommendation and Agency Response:

The Department held one public hearing on the proposed new rules and amendments. The hearing was held on Wednesday, October 14, 2009 at the New Jersey Department of Environmental Protection, Public Hearing Room, Trenton. The comment period for the proposal closed on November 7, 2009. However in response to public comments the Department extended the comment period by 30 days to Monday, December 7, 2009. The comments received by the Department are summarized and addressed below. The hearing officer for the October 14, 2009 hearing, Ruth Ehinger, Manager, Coastal Management Office recommended that the Department adopt the rules with the changes described in response to comments below and in the Summary of Department initiated changes. The hearing record is available for inspection in accordance with applicable law by contacting:

Department of Environmental Protection
Office of Legal Affairs
Attn: DEP Docket No. 12-09-08/734
401 East State Street, 4th Floor
P.O. Box 402
Trenton, New Jersey 08625-0402

This rule adoption can be viewed or downloaded from the Department's web site at http://www.state.nj.us/dep.

Summary of Public Comments and Agency Responses:

The Department accepted comments on the September 8, 2009 proposal through December 7, 2009 and reopened the public comment period until March 15, 2010 in response to Governor Christie's Executive Order No. 1 (January 20, 2010). The following persons presented oral comments at the October 14, 2009 public hearing and/or submitted written comments. .

1. Nelson Albano, Assemblyman, First Legislative District
2. Debe Besold, Tangarie Alternative Power, LLC
3. Karl Braun, Landsystems LLC
4. Paul Burgin, East Coastal Clean Energy Co., L.L.C.
5. Bradley Campbell, Delsea Energy
6. Daniel Cohen, Fisherman's Energy of New Jersey LLC
7. Mary Ellen Cronk, NorthLake Business Advisors
8. John Curran, Hazlet Area Quality of Life Alliance
9. Louis Cyktor
10. Tim Dillingham, American Littoral Society
11. Roger Dixon, Skylands Renewable Energy
12. Matt Elliott
13. Robert C. Fischer, Bayshore Regional Sewerage Authority
14. James Fry
15. Peter Furey, NJ Farm Bureau
16. Paul Gallagher, General Counsel, Fisherman's Energy
17. Michael Garrity, Atlantic City Electric Company
18. Michael Gross, Esq., on behalf of the Morey Corporation
19. Philip Haines, Senator, 8th Legislative District

20. Susan Kraham and Edward Lloyd, on behalf of the New Jersey Audubon Society, Natural Resources Defense Council and American Bird Conservancy
21. Joshua Levy
22. Christopher Len, on behalf of New York/New Jersey Baykeeper and Riverkeeper
23. Thomas Leyden, SunPower Corporation
24. Larry Liggett, New Jersey Pinelands Commission
25. Debbie Mans, New York/New Jersey Baykeeper
26. Amy Martin, PSE&G
27. Daniel Martin and Ryan Healey, Marathon Engineering & Environmental Services, Inc.
28. Donald McCloskey, PSE&G
29. Michael Mercurio, Island Wind, Inc.
30. Matthew W. Milmam, Assemblyman, First Legislative District
31. Valorie Montecalvo, Bayshore Recycling Corporation
32. Don Ochs, East Coastal Clean Energy Co., L.L.C.
33. James Pfeiffer, EnGeneration, LLC
34. Michael Pisuaro, Esq, on behalf of the New Jersey Environmental Lobby
35. Ron Popowski, United States Fish and Wildlife Service
36. John J. Renz, Delsea Energy
37. Glenn Rieth, New Jersey Department of Military and Veterans Affairs
38. Mary Sabik, Municipal Clerk, Borough of Union Beach
39. Laurie Sands
40. William Simmons, Monmouth County Health Department
41. Thomas Sims, Department of Air Force
42. Wade Sjogren, Whibco, Inc.
43. Paul Smith, Mayor, Borough of Union Beach
44. Jeff Tittel, Sierra Club, New Jersey Chapter
45. Jeff Van Drew, Senator, First Legislative District
46. Jeffrey Vasser, Atlantic City Convention & Visitor's Authority
47. Thomas Wells, The Nature Conservency

48. Bill Wolfe, NJ PEER
49. Christopher Zeppie, The Port Authority of New York and New Jersey
50. Cindy Zipf, David Byer, Heather Saffert and Jennifer Samson, Clean Ocean Action

A summary of the comments and the Department's responses follows: the number(s) in parentheses after each comment identifies the respective commenter(s) listed above.

General

1. COMMENT: Thirteen commenters requested that the Department extend the comment period by 90 days for the following reasons:
1. By regulating where, when and how wind turbines and other energy facilities can be sited and operated, the Department is engaging in a complex endeavor that spans many industries and agencies and has the real potential of inadvertently impeding the goals of New Jersey's Energy Master Plan;
2. The proposal includes significant amendments to the Department's coastal rules, and a 60-day comment period is insufficient to provide meaningful review and comment by those interested in and affected by the proposal; and
3. An extension will allow interested parties to provide new, relevant information, data and findings not previously considered by the Department and will provide such interested parties with time to review the documents cited in the proposal.

The commenters stated that a 90-day extension will not result in any adverse impacts to the public health, safety or welfare or the environment. The commenters further stated that, as a result of their reviews of the cited documents and the submission of the additional information in response to such reviews, the Department may be required to re-propose this proposal. (2, 4, 5, 11, 14, 15, 21, 29, 31, 32, 33, 36, 39)

2. COMMENT: The commenters support an extension of the public comment period on this proposal. According to the commenters, extending the comment period would allow the various individuals and organizations concerned with these amendments to provide

the Department with an incredible wealth of information that could be beneficial for the health of New Jersey's coast. (1, 19, 45)

RESPONSE TO COMMENTS 1 AND 2: The Department granted a 30-day extension to the public comment period for the proposed new rules and amendments to the Coastal Permit Program rules, N.J.A.C. 7:7; Coastal Zone Management rules, N.J.A.C. 7:7E; and Flood Hazard Area Control Act rules, N.J.A.C. 7:13 relating to wind and solar energy. The comment period for this proposal was originally scheduled to close on November 7, 2009. The Department extended the comment period by 30 days to Monday, December 7, 2009. (see 41 N.J.R. 4168(a))

3. COMMENT: While the commenter supports the development of renewable energy sources in New Jersey, this must not be done at the cost of impacting important coastal habitat and species. These regulations will provide predictability and transparency for smaller renewable energy projects, while ensuring that Department resources can be focused on reviewing larger renewable energy projects. (25)

4. COMMENT: Many of the changes proposed for some categories of renewable energy facilities will achieve the goal of streamlining the permitting of wind facilities in the coastal area. (49)

5. COMMENT: In general the intent of the proposed rules and amendments is supported. (24)

6. COMMENT: The Department is commended for proposing rules for New Jersey's coastal zone that will help streamline permitting for new wind and solar facilities that are likely to have relatively small impacts on wildlife along the State's coast, while placing strict limits on the construction of large scale wind energy facilities in areas where such facilities are likely to pose significant threats to wildlife. With all the unknowns regarding the potential impacts of wind energy facilities on wildlife, the proposed rules

represent a bold first step in promoting clean wind energy installations in New Jersey's coastal zone without sacrificing this area's abundant wildlife populations. (47)

7. COMMENT: The Department is applauded for attempting to address the installation of wind turbines and solar panels in the coastal zone. (34)

8. COMMENT: The extensive technical and scientific effort put forth by the Department to develop the proposed rules and corresponding Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits and Large Scale Wind Turbine Siting Map Report is appreciated. The proposed amendments and technical documents represent an important step forward by providing policies and procedures on how and where to develop wind energy within the State's environmentally sensitive coastal zone. (50)

9. COMMENT: The Department is commended for proposing a set of rules which will provide needed and statutorily required protection of the coastal zone, while affirmatively promoting and providing opportunities for appropriate renewable energy development there.

In addition, the rules create several regulatory approaches that will promote renewable energy development in several ways. The rule excludes certain wind and solar projects from regulation entirely. The permit-by-rule will allow small scale wind projects in appropriate locations without interaction with the Department, while setting appropriate restrictions on siting in environmentally sensitive areas, and requiring that projects be located so as to minimize adverse impacts to threatened and endangered and critical wildlife habitats. The general permit proposed increases the level of developer/Department interaction reflecting a higher level of potential risk for those projects authorized under its provisions. (10)

10. COMMENT: The Department is commended for recognizing the aggressive goals that have been established in this State through the Energy Master Plan and regional

greenhouse gas initiative. This is a complex issue involving evolving science and technology. (21)

11. COMMENT: The establishment of strong and uniform permitting requirements for wind and solar energy development is supported. (12)

12. COMMENT: The Department has done much with this proposal to assist the State in meeting its renewable energy goals while still protecting New Jersey's natural resources. (23)

13. COMMENT: New Jersey is a leader in recognizing long-term adverse effects of the continued increase of greenhouse gases. Some of the potential effects outlined in the proposal summary include ambient temperature rise, increase in sea level, geological changes, climate-related habitat loss, intense rain events, drier soil conditions, and temperature-related human stress. With the adoption of the Regional Greenhouse Gas Initiative, Governor Corzine's Executive Order 54, and the Global Warming Response Act, N.J.S.A. 26:2C-37 et seq., New Jersey is committed to reducing greenhouse gas use by 80 percent by the year 2050. The proposed rules will help in meeting this commitment by providing a mechanism to place appropriate energy sources in New Jersey's coastal zone. (27)

14. COMMENT: As noted within the proposal, "facilities that produce electric power are defined as development under the Coastal Area Facility Review Act….development of such facilities is regulated under the Waterfront Development Act… and the New Jersey Flood Hazard Area Control Act." These statutes provide the framework on which policies and regulations to promote and allow renewable energy development must be built, and must be respected and adhered to, given the Department's stated desire "to assist the State in meeting the ambitious renewable energy goals." As the Department is well aware, CAFRA requires the Department to "encourage the development of compatible land uses… within the framework of a comprehensive environmental design

strategy which preserves the most ecologically sensitive and fragile area from inappropriate development and provides adequate environmental safeguards for the construction of any development in the coastal area." These rules represent a well-reasoned first-step, consistent with this charge, in conserving the abundant wildlife that inhabits and travels through New Jersey's coastal zone while promoting renewable energy development. The proposed rules are built upon a sound scientific and technical foundation, well-supported by extensive literature citations in reference to wildlife habitat and behavior. (10)

15. COMMENT: Section 10 of CAFRA requires the Department to evaluate the extent to which a permit: conforms with all applicable air, water and radiation emission and effluent standards and all applicable water quality criteria and air quality standards; prevents air emissions and water effluents in excess of the existing dilution, assimilative, and recovery capacities of the air and water environments at the site and within the surrounding regions; and would cause minimal feasible interference with the natural functions of plant, animal, fish, human life processes at the site and within the surrounding region. In general, solar and wind installations meet all of these requirements and therefore should be encouraged. (34)

RESPONSE TO COMMENTS 3 THROUGH 15: The Department acknowledges these comments in support of the rule.

16. COMMENT: New Jersey policy leadership is about making choices appropriate to create the greatest net values for its people. These decisions require careful consideration of the tradeoffs necessary to reconcile policies that conflict. The Department has not met its responsibility to evaluate the larger issues at stake in favor of pursuing parochial interests. It must reconsider the rulemaking in a more balanced way to more properly consider both the threatening financial impacts to proposed land based wind projects and the greater global goals of advancing the development of renewable energy. (13)

17. COMMENT: The proposed rules create a situation wherein wind turbines and solar panels must meet requirements that no other project in the State has been asked to comply with. Any potential harm from the installation of wind turbines and solar panels is outweighed by the benefits these installations will create. (34)

18. COMMENT: These rules in many instances will not be reducing the barriers to the installation of renewable energy; in fact, these regulations may deter development of renewables. (34)

RESPONSE TO COMMENTS 16 THROUGH 18: The Department recognizes the benefits of renewable energy including solar and wind energy. In recognition of the benefits, the Department is adopting amendments which facilitate the installation of solar panels and wind turbines in the coastal zone by specifying when these facilities may be constructed without a Department permit and by providing permits-by-rule and general permits, which eliminate or reduce potential time and submission requirements, respectively. The adoption also reduces setback requirements.

Wind energy facilities are a new use in New Jersey's coastal zone. Given that the coastal area of New Jersey is part of the globally significant migratory corridor as well as critical habitat to numerous resident species, the Department must proceed cautiously. Therefore, the Department took a tiered approach to wind turbine development on land with wind turbines having the lowest potential impact qualifying for authorization under a permit-by-rule and the level of Departmental review increasing as the potential impacts associated with the location, height and rotor swept area increase. As information from the monitoring of wind turbines in New Jersey and elsewhere is gathered and information from published and unpublished studies or data evaluated, the Department will amend the rules as appropriate. As of April 1, 2010, 27 wind turbines have been constructed in New Jersey using funding from the New Jersey's Clean Energy Program. The Department has attempted to get information about each of the projects developed under this program regarding the height, rotor length, type of tower (monopole or lattice) and whether guyed wires are used. Of the 24 wind turbines for which the Department has data, all but the

Atlantic County Utilities Authority utility scale project meet the height and rotor swept area requirements of the permit-by-rule or coastal general permit. However, eight of the 24 turbines would not have qualified for the proposed permit-by-rule or general permit (i.e. would have been required to apply for an individual permit) because the height of lattice tower was 120 feet, which is beyond the 100 foot limit that was proposed. For the reasons discussed in response to comments 111 and 112, on adoption the Department is amending the height limit for lattice towers under the permit-by-rule and general permits to accommodate taller lattice towers. As adopted, 23 of the 24 existing wind turbines on which information is available would meet the size requirements for the permit-by-rule or general permit.

With respect to the installation of solar panels, the Department through these rules has deregulated the installation of solar panels on existing impervious surfaces as well as allowing them on landfills as part of a Closure and Post-Closure Care Plan.

19. COMMENT: The proposal is contrary to the stated energy priorities of the State since it does not encourage siting of energy efficient wind turbines. (18)

20. COMMENT: The proposal does not further the goals of New Jersey's Energy Master Plan nor does it further the goals of the Regional Greenhouse Gas Initiative. (21)

21. COMMENT: Rules and regulations limiting environmental impact from renewable energy installations are supported. However, the proposed rules are not about protecting the environment, but preventing the implementation of the State's Energy Master Plan. The rules will severely limit the ability to install a renewable energy facility in New Jersey.

The proposed rules are hypocritical because they make it tougher to build wind and solar energy facilities than shopping centers, race tracks or residential developments. Instead of a step forward, these rules are a step backwards and undermine New Jersey's efforts to deal with climate change and implement the State's Energy Master Plan.

Under the Energy Master Plan, the State has committed to 1,000 megawatts of solar and 400 megawatts of on shore wind. These rules would make it almost impossible for the State to meet those requirements. If the State wants to make a serious attempt at meeting those goals these rules as currently proposed must be pulled and re-proposed. (44)

RESPONSE TO COMMENTS 19 THROUGH 21: The Energy Master Plan calls for 1,000 MW of solar energy and 200 MW of energy from wind facilities located on land by 2020. The adopted amendments do not severely limit the ability to install a renewable energy facility in New Jersey. Instead, the adopted amendments improve the ability to install wind turbines and solar panels by providing permits-by-rule and general permits, reducing setback requirements and exempting wind turbines from review under the Coastal Zone Management rules' High-rise structures rule. In contrast, general permits and permits-by-rule are not available for the construction of race tracks, shopping and residential developments other than single family homes or duplexes. Wind turbines less than 200 feet in height or having a cumulative rotor swept area of 4,000 square feet that do not qualify for the permit-by-rule or general permits are not necessarily precluded from being built; instead they are required to apply for an individual coastal permit. The proposed amendments also provide predictability through the Large Scale Wind Turbine Siting Map and the Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits. Further, the adopted amendments facilitate the installation of solar panels by not requiring a coastal permit for the installation of solar panels on or structurally attached to a legally existing building or utility pole within a maintained right-of-way, on legally existing impervious cover outside of the floodway, and on sanitary landfills when they are included in the Closure or Post-Closure Care Plan or modified Plan; and by creating a permit-by-rule for solar panels at single family homes and duplexes.

With respect to Section 10 of CAFRA, the Department's Large Scale Wind Turbine Siting Map and monitoring requirements address the finding that the development causes

minimal interference with the natural functions of plant, animal, fish and human life processes at the site and within the surrounding region.

22. COMMENT: The commenter is strongly opposed and concerned with the Department's proposed amendments loosening the regulations for the construction of wind and solar energy facilities. (38)

RESPONSE: To assist the State in meeting its ambitious renewable energy goals, the Department proposed the amendments adopted herein, including new coastal general permits and permits-by-rule, to address the regulation and permitting of wind turbines and solar panels and to facilitate construction of these facilities in appropriate locations. In proposing and adopting these regulations, the Department considered the impacts of the wind turbines on the natural environment in determining where and under what conditions wind turbines may be appropriately approved pursuant to a permit-by-rule, general permit or individual permit, as well as where larger scale turbines are not appropriate. With respect to wind turbines on land, the rules take a tiered approach, with wind turbine development having the lowest potential impacts qualifying for authorization under a permit-by-rule and the level of Department review increasing as the potential impacts caused by the location, height or construction method of the wind turbine increase.

23. COMMENT: The rules do not address the cumulative impact of "build-out" development under the scenarios required by the Energy Master Plan. While the proposed rule does provide for adjustment to the Large Scale Wind Turbine Siting Map, the Department must also continue to develop proactive planning and impact assessment methodologies to anticipate the likely high demand for both land-based and offshore wind development given the Energy Master Plan and other influences.

Conversely, it is important to note that the area restricted for land based wind development does not unreasonably restrict meeting the Energy Master Plan goal of renewable energy development aspirations. Of the total area within CAFRA/Waterfront

Development jurisdiction (324,954 hectares), only approximately 30 percent is subject to restriction under the rule (96,392 hectares). Even then, much of that area is only subject to a higher degree of regulatory review, and not on the ground exclusion from consideration for development. (10)

RESPONSE: The Department agrees that it will have to adjust the map and rules based on its experience with the construction and operation of wind turbines on land as well as the ocean demonstration project. The Department will evaluate the data gathered from the monitoring of wind turbine facilities in New Jersey and elsewhere and information from published and unpublished studies and data as well as the baseline study findings to refine the rules as necessary.

24. COMMENT: Given the environmental imperative of reducing greenhouse gases which is the centerpiece of the State's Energy Master Plan, and in recognition of the New Jersey Board of Public Utilities' many programs to promote renewable energy, the Department must re-evaluate the proposed rulemaking to achieve optimal congruence with the foregoing Statewide programs. (49)

25. COMMENT: New Jersey's Energy Master Plan demands the development of 200 megawatts of onshore wind energy by the year 2020 and 3000 megawatts of offshore wind energy in that same year. While the subject of the rulemaking specifically impacts the development of the onshore wind component, the overall development of this particular energy strategy is among the most important to be achieved. The Energy Master Plan recognizes the significant capital resources required to develop land-based wind resource facilities and calculates that each megawatt of installed capacity would require capital outlays of approximately $2.5 million in order to achieve energy production at 34 percent availability. Class I renewable energy credits and other publicly funded subsidies are recommended in the master plan to help support the economies of land-based wind energy projects in recognition of the important role that project

economies play in the wind energy development process. In addition, the New Jersey Board of Public Utilities states:

> "The BPU staff will continue to monitor the progress that is being made with onshore wind energy generating Technologies. As Technology breakthroughs occur, the BPU will act quickly to adjust its policies to ensure the aggressive development of wind energy, as part of the State's energy portfolio."

The Department's proposed new rules will have a severe impact on the reasonable deployment of alternative energy facilities in the State. The disconnect between the BPU and Department's views on the State's energy portfolio could not be more evident from the proposed requirements of the rulemaking. The Department's proposed rules use a one-size-fits all approach to regulating wind turbines irrespective of project size, impose costly studies without demonstrating a corresponding benefit, place siting restrictions that make the meaningful development of wind power in the State an unlikely occurrence, and create unreasonable over-protective setback requirements on wind turbines in areas where they are permitted. (13)

RESPONSE TO COMMENTS 24 AND 25: The Department understands that it is critical to reduce greenhouse gases and support renewable energy. In order to strike a balance between the promotion of renewable energy and the protection of the State's natural resources, the Department has taken a tiered approach to regulation of wind turbines on land in the coastal area, with wind turbine development having the lowest potential impacts qualifying for authorization under a permit-by-rule and the level of Department review increasing as the potential impacts caused by the location, height or construction method of the wind turbine increases. Because wind turbines are a relatively new use of coastal resources, the Department is requiring monitoring of the larger-sized turbines to determine the impacts of their operation on birds and bats. The Department's guidance and interpretation regarding the monitoring requirements set forth in the Coastal Permit Program rules, N.J.A.C. 7:7 and Coastal Zone Management rules, N.J.A.C. 7:7E is contained in the technical manual. In response to comments received, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply

with N.J.A.C. 7:7E-7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules is developed. As a result of that review, various changes have been made to the technical manual. The Department will consider alternative methods than those described in the technical manual provided such alternative methods will provide the same level of data gathering that is currently provided by the technical manual in order to enable the Department to evaluate the impacts of wind turbines constructed along the coast and compare data from different wind turbine developments. The Department will evaluate the data gathered from the monitoring of wind turbine facilities within the coastal zone and elsewhere and information from published or unpublished studies or data and amend the rules as appropriate.

26. COMMENT: The protections for threatened and endangered species and their habitats are supported. However, it is hypocritical not to enforce the same rules for residential, industrial and commercial development. For example, these limitations restrict solar farms in places where racetracks are allowed. The Millville Racetrack, with all of its pollution, was permitted in the middle of one of the most important bird migration areas in the country. However, under the proposed rules, a wind turbine would be unacceptable.

The proposed rules do not allow windmills along the Delaware Bayshore and a lot of New Jersey's coastal areas but the Department permitted a power line along the coast through the Pinelands and would not block a proposal for a massive power line with hundreds of monopoles cutting across the Delaware Bayshore. Nuclear power plants without cooling towers and outdated coal plants, such as the BL England coal plant, contaminate New Jersey's fisheries and waterways and threatened wildlife much more than renewable energy installations. (44)

RESPONSE: The adopted amendments do not limit the location of solar farms. Rather, the rules facilitate the installation of solar panels by not requiring a coastal permit for the

installation of solar panels on or structurally attached to a legally existing building or utility pole within a maintained right-of-way, on legally existing impervious cover outside of the floodway, and on sanitary landfills when they are included in the Closure or Post-Closure Care Plan or modified Plan, and by creating a permit-by-rule for the construction of solar panels at single family homes. The Millville Racetrack is not located within the CAFRA area and therefore no CAFRA permit was required.

Power lines are not regulated under CAFRA. The Department identified specific areas on land where large scale turbines (200 feet in height or taller or having a cumulative rotor swept area of 4,000 square feet) are unacceptable due to the operational impacts to birds and bats. While the lower Cape May Peninsula is mapped, high tension towers associated with power lines may be acceptable as they are less than 200 feet in height and do not have the same operational risks as wind turbines.

27. COMMENT: The coastal area of New Jersey is regulated by the Department under a variety of enabling statutes and administrative regulations. However, there is a striking difference between the portion of the coastal area that the State legislature has sought to regulate under CAFRA and that which they determined to leave under the jurisdiction of the Waterfront Development Law.

The Legislative findings of CAFRA clearly articulate and recognize the important natural resources found in the "coastal area" defined in the CAFRA statute, the need to protect them, and the need to institute patterns of land use in the coastal areas which concentrate development activities and discourage dispersion of development. In contrast, the Department's jurisdiction under the Waterfront Development Law has the historical focus of commercial and industrial improvement of waterfront within which construction of docks, wharfs, piers, bulkheads, bridges, pipelines or cables or similar or dissimilar waterfront development is contemplated so as not to impair the uses of others.

While it is understood that these concerns are not mutually exclusive, it is not unreasonable to conclude that greater emphasis on natural resources, including indigenous and migratory species, should be given to coastal areas of the State with lower population densities and extensive and diverse natural resource habitats, such as those of

the CAFRA area, as contrasted with those areas with high population densities and extensive commercial and industrial development in the waterfront development area. In fact, many of the regulations enforced by the Division of Land Use Regulation impose additional requirements and restrictions under CAFRA.

Under the proposed rulemaking which seeks to encourage renewable energy in the coastal area, there should be greater consistency in the proposed amendments with the existing regulatory differences for areas regulated under the jurisdiction of Waterfront Development versus CAFRA.

Smart growth principles encourage development and redevelopment including Brownfield redevelopment in the urban core as contrasted with suburban sprawl. Suburban sprawl is energy inefficient, makes use of "Greenfields" and induces greenhouse gas emissions attributable to transportation by single occupancy vehicles.

Smart growth with its attendant higher population densities also creates electrical "load pockets" where electrical demand exceeds generation capacity. It is precisely in these areas where renewable energy capacity makes the most sense. With respect to the proposed rulemaking, a regulatory scheme that gives more favorable treatment to encouraging renewable energy resource development in areas of high demand provides a needed underpinning to principles of smart growth as discussed above and as expressed in the State's Development and Redevelopment Plan. This is also consistent with the intent of the Waterfront Development regulations.

There is significant connectivity between the foregoing concerns, which underscores the need for a more favorable regulatory scheme to encourage renewable energy in the coastal areas of the State falling exclusively within the waterfront development area. In other words, a distinction has been recognized by the State Legislature in its enactment of CAFRA with respect to southern New Jersey and urban coastal areas and the propriety of serving high load pocket areas with renewable energy as a tenet of smart growth. Additionally, with respect to air emissions and air quality, there is an attendant benefit, both actual and perceived, to promoting renewable energy in areas of poor air quality such as the urban core, relative to the coastal areas of the State which are more rural and natural in character. Therefore, the Department should do everything within its discretion

to assist and promote siting of renewable energy facilities within its waterfront development jurisdiction, without imposing arbitrary limits and thresholds with regard to their size. (49)

RESPONSE: With respect to energy facilities, the CAFRA area and waterfront development areas are treated differently. In the CAFRA area, energy facilities cannot be sited within 500 feet of the mean high water line and wind and solar energy facilities within 50 feet, and energy facilities cannot be sited in the water. With the exception of the more pristine areas, there are no such buffer requirements in the waterfront development area. In fact, in the New York New Jersey Harbor, the energy facility use rule does not prohibit the construction of energy facilities, including wind turbines in the water, nor does it require a setback from the mean high water line.

As stated previously, with respect to solar energy facilities, the Department through these rules has deregulated solar panels when located on existing impervious surfaces including urban areas as well as allowing them on landfills as part of a Closure and Post-Closure Care Plan.

28. COMMENT: The Coastal Zone Management rules allow high intensity development in areas where wind turbines and solar panels are not permitted. The rules allow 80 percent impervious coverage or 24 residential units per acre in Lakewood Township, Ocean County. However, the proposed rules would not allow the construction of a wind turbine or solar energy facility in Lakewood Township on undisturbed vacant land. Similarly, the impervious cover limit in Tuckerton, Ocean County is 70 percent, a density of 20 residential units per acre. Again, wind turbines and solar panels would not be permitted. The same applies to rural areas such as Manchester and Little Egg Harbor Townships, Ocean County, where the impervious cover limit is 30 percent or six to eight residential units per acre. It is unfortunate that if one wants to construct renewable energy facilities, the land on which they will be proposed must first be developed. (44)

RESPONSE: Lakewood Township, Tuckerton Borough, and Manchester Township Ocean County are not mapped on the Department's Large Scale Wind Turbine Siting Map as areas where wind turbines 200 feet in height or taller or having a cumulative rotor swept area of 4,000 square feet are unacceptable due the operational impacts of the turbines on birds and bats. While a portion of Little Egg Harbor Township, Ocean County is mapped, the mapped areas are for the most part Federal or State lands or wetlands. It is incorrect that wind turbines and solar energy facilities are not permitted anywhere in these municipalities. Furthermore, wind turbines less than 200 feet tall with a rotor swept area less than 4,000 square feet are not subject to restriction by the Department's Large Scale Wind Turbine Siting Map.

29. COMMENT: Turbines placed in coastal areas may present greater risks of bird collisions because of the presence of both nesting and transient migrants, which make frequent low-level flights while feeding or migrating. Pre-construction monitoring may document a large number of resident/migratory bird species in the proximity of the project site, indicating that there could be a potential for adverse impacts to birds. According to 2001 estimates for 15,000 terrestrial wind turbines in the United States, approximately 28,000 birds were killed compared to the hundreds of millions of birds killed by other causes (e.g., pesticides, automobiles, communication towers, coal strip mining, oil and gas extraction, high tension lines, commercial fishing, house cats and glass windows (Erickson et al 2001; Kerlinger and Hatch, 2001). Yet wind power facilities in coastal areas have not been sufficiently investigated. (35)

RESPONSE: The provision of a tiered system of regulation will enable the Department to streamline the review of coastal permit applications for those wind facilities that are not likely to have an adverse impact on resources of the coastal zone while assessing the potential impacts of larger scale turbines through a more detailed review process in order to protect these coastal resources. The general permits and standards for review of individual permits require post-construction monitoring for birds and bats. For the largest turbines, pre-construction monitoring is also required. This information will

enable the Department to evaluate the effects of these wind turbines on birds and bats and modify its rules accordingly. The information developed will also allow the Department to determine appropriate curtailment measures based on the data obtained.

Using current wildlife data, the Department's Division of Fish and Wildlife has developed the Large Scale Wind Turbine Siting map which depicts areas where wind turbines 200 feet in height or taller, or with a cumulative rotor swept area of greater than 4000 square feet on a site, would pose a significant risk to birds and bats and would not comply with existing rules. In the mapped areas, the construction of these large scale wind turbines is unacceptable due to the operational impacts of the turbines on birds and bats. Under these rules, the Department can revise the map based on new information on species occurrence, new information on appropriate buffers, or new information on impacts developed from ongoing monitoring or from published and unpublished studies or data.

30. COMMENT: The Department is urged to initiate meaningful public involvement in all stages of site and project selection and development. Early public engagement beginning at the planning stage, will promote more efficient and less contentious review of specific projects as they move through the permitting process. The Department is urged to form a science advisory team to assist the Department in determining the scale, scope and extent of data necessary to accurately predict risk to organisms and habitats and to ensure protocols, criteria and models are based on objective, scientifically valid information. (20, 50)

RESPONSE: With respect to the siting of wind turbine developments on land, the Department, through its Large Scale Wind Turbine Siting Map, has identified areas where the construction of large scale wind turbines is unacceptable due to the operational impacts of the turbines on birds and bats. With respect to offshore waters, the Department's ecological baseline study, released in July 2010, provides data on bird densities, altitudes, migration and behavior, as well as data on sea turtles, marine mammals, fish and habitats. (See http://www.nj.gov/dep/dsr/ocean-wind/index.htm) The

Department anticipates that this data will be used as a guide to the siting of wind turbines in offshore waters.

The Department believes that the current public process associated with the permitting and review of wind facilities at both the State and Federal levels provides opportunities for meaningful public involvement and is adequate to determine any major risks to organisms and habitats, including the habitat evaluation and assessment information that is required and the additional data collected by developers pre- and post-construction. Accordingly, the Department does not plan create separate advisory groups or teams to assist in the siting of wind turbine facilities.

31. COMMENT: Many interested parties already participate in the New Jersey Board of Public Utilities Offshore Wind Stakeholder Group and the Ocean/Wind Power Ecological Baseline Studies Interested Party Group, but as currently being utilized, both groups are more about public outreach and neither has proven to be a forum for substantive public involvement. Therefore, the State should convene a new Stakeholder Workgroup whose sole purpose is to provide meaningful public participation and input to the government task force as the State moves through this new process of offshore renewable energy development. (50)

RESPONSE: The Department agrees that it is important to get the input of scientists and experts in designing data collection from offshore wind developments and understanding results. For this reason, the baseline studies referred to by the commenter were designed by the Department and Federal agencies considering the best available scientific methodologies and information from academia, industry and non-profit organizations. As stated in response to comment 30 above, the current public process associated with the permitting and review of wind facilities at both the State and Federal levels will be utilized; the Department does not plan to create separate advisory groups or teams.

32. COMMENT: State laws and regulations and municipal ordinances need to remove a lot of the obstacles to the installation of renewable forms of energy. These rules are in

some ways a move in that direction. However, the State needs to go further in removing the obstacles and the Department may not be the appropriate place to do so. (34)

RESPONSE: The Department can only address aspects of wind energy over which it has authority. For the construction of wind turbines in the coastal zone, the Department has the authority to review proposed projects and, where appropriate, approve them through the issuance of a coastal permit. The Department acknowledges the commenter's support of these new rules and amendments as a step in the right direction. The Department will evaluate the data gathered from the monitoring of wind turbines in the coastal zone and elsewhere, and information from published and unpublished studies and data and refine the rules as appropriate.

33. COMMENT: The proposed rule fails to address the human health and safety impacts that may exist as a result of the operation of industrial wind turbines. The proposal should not be adopted as the conclusions made in the proposal are premature and incomplete in their scope and intent. Until all of the human health and safety impacts associated with the operation of industrial wind turbines have been addressed and fully explored, and until pre- and post-construction studies and monitoring with respect to human health and safety have been incorporated into the rules, the proposal should not move forward.

Foremost among the human health and safety factors that must be addressed are the effects of infra-sound and low-frequency noise and vibrations, as well as flicker and shadow effects on humans living and working near industrial sized wind turbines. The Department's principles, considerations and acknowledgements with respect to the impacts of wind turbines on wildlife must be applied to human health and safety to a greater degree.

Numerous human health and safety studies linking the direct causal effects of industrial turbines to human illnesses have been conducted worldwide. One such study conducted by Dr. Nina Pierpont explains the causal relationship between infra-sound and low-frequency noise and vibrations, flicker and shadow effects caused by industrial wind-

turbines and the cluster of symptoms that have appeared in humans living near the turbines, known as Wind Turbine Syndrome. Dr. Pierpont provided testimony before the New York Legislature on March 6, 2007 concerning her findings. Many other studies supporting Dr. Pierpont's findings have been conducted. A listing of research and studies relating to the effects of wind turbines on human health was provided. (8)

RESPONSE: The Department is aware of the noise concerns surrounding wind turbines which have affected siting decisions around the country and has reviewed the work of Dr. Pierpont regarding the symptoms of people who live in the vicinity of wind farms. The potential role of flicker affecting the health of sensitive individuals has also been examined. The Department acknowledges the concerns expressed by the commenter and plans to investigate these concerns further.

34. COMMENT: In May 2009, the Minnesota Department of Health reported on the potential public health issues related to low frequency noise and shadow flicker associated with wind turbines when setbacks to residential developments are inadequate. (see http://www.health.state.mn.us/divs/eh/hazardous/topics/windturbines.pdf). The proposed amendments and the New Jersey noise regulations do not address the potential effects of low frequency noise from wind turbines on public health. According to the Minnesota report, a nighttime noise standard of 50 dBA under predicts noise impacts inside dwellings at night because the preponderance of low frequency sound is not readily attenuated by windows or walls. Therefore, the New Jersey nighttime noise standard of 50 dBA does not address the effects of the low frequency noise on the public generated by wind turbines. The World Health Organization recommends 35dBA as the maximum allowable noise level for wind turbines averaged over the night inside the bedroom. The Minnesota report also recommends 35dBA. Further, the following setbacks for wind turbines are recommended: 2,600 feet from residences; up to 3,000 feet to reduce shadow flicker; and 900 feet from the nearest road to prevent driver distraction.

Given the above, how will the Department determine that applicants have demonstrated that a wind turbine in a residential area will meet N.J.S.A. 13:1G-3d "noise means any sounds of such level and duration as to be or tend to be injurious to human health or welfare, or which would unreasonably interfere with the enjoyment of life or property throughout the State or a portion thereof."?

Renewable energy projects are being funded by federal grants to stimulate the economy. However, if it is determined that such wind turbines were sited too close to residences, such turbines may need to be shut down during peak periods of wind. In January, the Governor signed legislation that decrees that wind turbines are inherently beneficial under New Jersey's land use laws. Does the Department plan to have the New Jersey Noise Council determine a uniform regulatory approach for wind turbine noise, and whether current noise regulations, including the Model Noise Code, need to be revised to include standards for low frequency noise for wind turbines? (39)

RESPONSE: The Department has reviewed the cited Minnesota Department of Health document. The penetrating properties of low frequency sound are understood and the Department plans to investigate the concerns regarding low frequency sound further.

35. COMMENT: The jobs impact section of the proposal should more accurately characterize the impact of the regulations on the reduction in the wind energy potential in the State. The Department is correct the regulations will stimulate job growth and renewable energy; because it does allow some growth in wind energy and at present the State has minimal wind energy. It is also true that the regulations will add turbine monitoring jobs. However, the regulations will significantly reduce the original wind energy potential estimates of 200 megawatts as noted in the Energy Master Plan. Original estimates assumed that the coastal areas with the highest wind potential would provide wind energy. The Department's regulations prohibit large scale wind and limit cumulative small-scale wind systems in most of these areas, significantly reducing New Jersey's wind energy potential and related job growth. (7)

RESPONSE: The Department disagrees that the regulations prohibit large scale wind and limit cumulative small-scale wind systems in most of the coastal area. Of the total area within CAFRA and Waterfront Development jurisdiction, approximately 29 percent is subject to restriction due to the operational impacts of wind turbines on birds and bats. Of the 29 percent approximately 70 percent or 168,600 acres is wetlands. These mapped areas are areas where the Department has sufficient data to determine that large scale wind turbines would cause unacceptable levels of mortality to birds and bats. Further, the Department reduced the energy facility setback requirement from 500 feet from the mean high water line to 50 feet for wind and solar energy facilities allowing the construction of wind turbines in areas where they were not previously allowed.

36. COMMENT: The rules lack the technical awareness of what is happening in terms of the development of wind turbine technology. The restrictions in the rule are framed in terms that will not survive the test of time. For example, a five megawatt wind turbine of today may look very different than one at the time the rule is adopted and one in the future. Yet the rules assume that technology is static. The rules preclude wind developers from an approach in which they can show that the impacts of their turbine will be less than the rule currently assumes. The rule needs to be more flexible and more supportive of alternate energy. (5)

RESPONSE: The Department acknowledges that technology may change. Accordingly, the rules recognize both vertical and horizontal wind turbine technologies. Further, the rules only cite power rating with respect to the demonstration project, which is also in recognition that the power rating of a wind turbine may not correspond to the size of the turbine. The rules also take into account that future amendment to the rules may be appropriate based on new data and information obtained from the pre and post construction monitoring, as well as published and unpublished studies and reports. The Department believes that the rules provide flexibility and are supportive of alternate energy by providing permits-by-rule and general permits and reducing setbacks. Further, the Department's Large Scale Wind Turbine Siting Map adds predictability by

identifying areas where, based on current wildlife data, large scale wind turbines are not acceptable due to operational impacts to birds and bats.

37. COMMENT: These rules do not need to be adopted quickly, rather the Department should work with representatives of industry and the environmental lobby to craft a rule that better represents and addresses the issues that will help this State achieve the goals of the Energy Master Plan. (21)

RESPONSE: The Department believes it is important to adopt these rules at this time to provide streamlined permitting for smaller wind turbines, more predictability in siting large wind turbines and relief from setback requirements for wind turbines. In addition, the adoption will reduce the permitting requirements for solar panels.

38. COMMENT: The rule proposal is flawed as the Federal standards analysis did not evaluate the proposed rules against existing Federal standards. The standards of the rule are more restrictive than the Federal standards. (5)

RESPONSE: The Department assumes the commenter is referring to the Federal regulations adopted by the Department of Interior for Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf 30 C.F.R. 250, 285 and 290. The standards contained within those regulations apply in Federal waters only whereas the State rules are adopted for State lands and waters.

39. COMMENT: The Department must justify all standards contained in the proposal. (12)

RESPONSE: The Department believes that the proposal summary adequately addresses and explains the rationale for these rules. Where specific questions have been raised through public comment, this adoption addresses such comments.

40. COMMENT: In support of the increased demand for renewables directed by New Jersey's Renewable Portfolio Standard (RPS) filing which requires 22.5 percent of energy produced be from renewables for Energy Year June 1, 2020 through May 31, 2021, and the New Jersey Energy Master Plan which strives to exceed the current RPS and meet 30 percent of the State's electricity needs from renewable sources by 2020, it is requested that the Department consider allowing alternative standards for renewable energy projects which support these renewable goals in New Jersey.

Of specific concern are the requirements of the Coastal Permit Program rules, N.J.A.C. 7:7 and Coastal Zone Management rules, N.J.A.C. 7:7E which require permanent public access to the waterfront. Utility and power production locations have increased concerns in regards to the health, safety and welfare of the citizens of New Jersey. The requirements for public access constrain a site in its ability to provide safe, reliable, economic and green energy to its customers. While the rules allow for new or existing energy facilities to provide public access at a nearby off-site location, land availability and land purchase costs involved with off-site locations can potentially rule out the viability for a solar or wind project.

It is requested that the Department consider removing the public access requirements for renewable energy projects in support of the New Jersey Energy Master Plan and New Jersey's RPS. (26)

RESPONSE: The Department's Coastal Zone Management rules recognize that existing industrial properties with developed waterfronts, as well as energy facilities, may present situations that warrant modification of the public access requirements due to the risk of injury. In such cases, the Department would instead require alternate public access at a nearby off-site location. In general, the Department does not anticipate a conflict between the provision of public access and wind and solar energy facilities. For example, the Borough of Ocean Gate has constructed a 50 KW wind turbine adjacent to their municipal facilities and in close proximity to a residential development. In addition, solar panels are installed in parking garage decks and over parking lots.

41. COMMENT: In addition to general permits and permits-by rule, the Department should offer a fast-track decision timeline for energy projects so that developers of such projects can take advantage of available State and Federal grants. (3)

RESPONSE: The Department believes that this adoption streamlines the review of renewable energy projects, both through adoption of general permits and permits-by-rule, reducing requirements such as setbacks and height restrictions and providing greater predictability through the Department's Large Scale Wind Turbine Siting Map.

42. COMMENT: Consideration of any economic impacts in the Department's evaluation of a proposed energy facility should be minimized. (3)

RESPONSE: The Department will apply applicable rules when reviewing an application for an energy facility. The rules contain location, use and resource standards but do not have specific standards for economic impacts.

43. COMMENT: The Department should allow the construction of wind turbines in all areas of the coastal zone. The Department should review each wind turbine project on a site-specific, case-by-case basis in regards to wildlife species habitat and migratory pathways. Using the data collected from geophysical and wildlife studies, a collaborative decision on the placement of wind turbines at a specific site would then be feasible. (27)

RESPONSE: Project applications will be reviewed on a case-by-case basis. However, to provide predictability, the Department has prepared a map that identifies those locations where the Department already has sufficient data to determine that wind turbines 200 feet in height or taller or having a cumulative rotor swept area greater than 4,000 square feet are unacceptable due to operational impacts of the turbines on birds and bats. In those areas where data has already been analyzed and a determination made that the impacts from larger scale wind turbines are too significant to wildlife to be acceptable, the Department does not believe that additional data would change that decision. As noted in

response to comment 145, the rule contains provisions for changing the map.

Red Tape Review Process and Rulemaking; Executive Order Nos. 1 through 3(2010)

44. COMMENT: The Governor's Red Tape Review executive orders have raised potentially troublesome issues for the Department's rulemaking and enforcement process. Considering the economic impacts of environmental regulation is a fraught process. Even the best economists struggle to quantify environmental benefits in dollar terms; their best efforts, with the benefit of hindsight, tend to under appreciate environmental value at the time of quantification tragically and repeatedly. Economists struggle with correctly finding and valuing the external impacts of economic transactions, discount rates and contingent values for natural resources; most ecosystem services are not captured in market transactions and are thus of indeterminate value. There is simply no economically viable way for the Department to say, for example, that 15 shopping malls are of equal value to New Jersey as a self-sustaining osprey population.

Cost benefit analyses of environmental regulation, when attempted, are invariably wrong, invariably non-confirmable and invariably minimize the benefit while maximizing the cost. Including such cost benefit analyses in the regulatory process is an important decision for any statute, and legislatures are well aware of the importance of deciding on whether particular legislation will impel or forbid such a process.

Inappropriately applying cost benefit analyses is a common and fatal mistake many levels of government make; one that often puts them on the wrong end of an environmental lawsuit.

While true benefit analysis is probably not possible, only a highly trained economist can be expected to wade through analysis of contingent valuation, externalities and discount rates. Reasonable analysis, let alone accurate analysis, is not possible for a layperson to produce. The commenter's understanding is that the Department has not used any particular economic theory to generate its benefits analysis, has no methodology to quantify benefits, has not used economists to review the effects of these rules and has only one economist on staff for the entire department. Although it is good that the

Department concludes that its rules are justified by their benefits, a qualified economist is likely to find far greater benefit than the Department has. (22)

RESPONSE: Governor Christie's Executive Order No. 2 delineates "common sense principles" for rulemaking that are intended to provide the "opportunity to energize and encourage a competitive economy to benefit business and ordinary citizens." At section 1a, the Executive Order directs all State agencies to solicit the advice and views of knowledgeable persons from outside of New Jersey State government, including the private sector and academia, in advance of any rulemaking. At section 1d, the Executive Order directs State agencies to "employ the use of cost/benefit analyses, as well as scientific and economic research from other jurisdictions, including but not limited to the federal government when conducting an economic impact analysis on a proposed rule."

The Administrative Procedure Act (APA) at N.J.S.A. 52:14B-23 and 24 (P.L. 1995, c.65, effective June 5, 1995, which codified the substance of Governor Whitman's Executive Order No. 27(1994) into the APA) requires State agencies that adopt, readopt or amend State regulations that exceed any Federal standards or requirements to include in the rulemaking document a comparison with Federal law. The analysis must include a cost-benefit analysis that "supports the agency's decision to impose the standards or requirements and also supports the fact that the State standard or requirement to be imposed is achievable under current technology, notwithstanding the Federal government's determination that lesser standards or requirements are appropriate." Therefore, since 1994 in accordance with State law the Department has included a cost-benefit analysis in all of its rulemakings where the rules or standards exceed Federal law.

The APA at N.J.A.C. 7:52-14B-4(a)2 requires State agencies to include in each rulemaking a "description of the expected socio-economic impact of the rule." The Office of Administrative Law's Rules for Agency Rulemaking implement the APA and require at N.J.A.C. 1:30-5.1(c)3 that a notice of proposal include "an economic impact statement which describes the expected costs, revenues, and other economic impact upon governmental bodies of the State, and particularly any segments of the public proposed to be regulated." Each of the Department's rule proposals contains such a statement.

As required by the APA and the Rules for Agency Rulemaking, the Department's rule proposals also contain statements of social impact, jobs impact, agriculture industry impact, impact on small business (regulatory flexibility analysis); and statements addressing the proposed rules' impact on smart growth and the cost of housing. The Department in addition includes an environmental impact statement, describing the impact that its proposed rules will have on the environment.

The Department acknowledges that it has not historically provided as much detail in its impact analyses as an economist might. The Department endeavors to employ a practical approach to its determination of the costs and benefits of its rulemakings, and necessarily relies to a certain extent on information developed by other sources. For instance, the Department may adapt and tailor to the circumstances in New Jersey the economic analysis for a rule performed by another state or the Federal government. In addition, the Department conducts informal and formal outreach to regulated communities, environmental interest groups, the U.S. Environmental Protection Agency, other Federal and State agencies, agencies of other states, and the general public in the early stages of rulemaking. This is particularly the case for larger, more complex rulemakings. The Department will publish notice on its website or in the New Jersey Register, and/or use mail and electronic mail to known stakeholders, providing a description of the rules anticipated to be changed and the timeframe and means by which input will be gathered, for instance, at informal meetings or by written submissions, or both. Through outreach such as this, the Department obtains information on possible costs and benefits of rules that it is developing, as well as suggestions for the approach the Department should take in pursuing its regulatory goals.

Through the impact statements and Federal standards analyses for its rulemakings the Department attempts to identify the anticipated costs and benefits that will result from the proposed rules, including reasonably foreseeable indirect or secondary costs and benefits. The Department does attempt to identify and describe, even if it cannot always quantify in dollar terms, the proposed rules' costs and benefits in order to provide the public with as complete a picture and/or rationale as possible regarding the positive and negative economic impacts of the rulemaking.

Going forward the Department anticipates looking to the scientific and economic research of other jurisdictions and conducting advance outreach for its rulemakings in order to obtain enhanced insight into the costs and benefits that will flow from its rules and help accomplish the regulatory balance contemplated by Governor Christie's Executive Orders.

45. COMMENT: The Governor's concern that Department standards may, in some instances, exceed Federal standards is misplaced. The Federal law in most environmental matters acts as a basement, below which states cannot fall, but above which they may build. The Congress and the EPA are aware that they are setting national minimums, just as they are aware that the states are very different. A minimum that makes sense in a relatively unpopulated state such as Montana, will not necessarily make sense in New Jersey, the most densely populated state in the country. A minimum in a relatively virgin state such as Oregon will not necessarily make sense in New Jersey, a state with legacy of toxic industrial pollution. In this context, it is not only appropriate that New Jersey's regulations would exceed Federal standards in a number of instances, it is essentially mandatory. Any state's environmental protection agency that is doing its job will find instances where the peculiarities of the particular state make Federal regulation inadequate.

New Jersey's regulations, because of the State's population density, industrial legacy and proximity to several huge metropolitan areas, should probably exceed Federal standards in many and diverse ways. The Department is uniquely positioned to use Federal standards as a starting point to create regulations that specifically address the unique problems facing New Jersey and its citizens. The Department, therefore, should not hesitate to exceed Federal standards when the health, safety, and welfare of New Jersey's citizens and its environment require it. (22)

RESPONSE: The APA at N.J.S.A. 52:14B-23 and 24 requires State agencies to include in their Federal standards analysis a discussion of the policy reasons that support the agency's decision to impose a standard that is more stringent than a comparable Federal

standard. This is in addition to the cost/benefit analysis that the APA requires, as discussed in the immediately preceding response. The Legislature stated, at N.J.S.A. 52:14B-22, "[i]t is the declared policy of the State to reduce, wherever practicable, confusion and costs involved in complying with State regulations. Confusion and costs are increased when there are multiple regulations of various governmental entities imposing unwarranted differing standards in the same area of regulated activity. It is in the public interest that State agencies consider applicable federal standards when adopting, readopting or amending regulations with analogous federal counterparts and determine whether these federal standards sufficiently protect the health, safety and welfare of New Jersey citizens."

Governor Christie's Executive Order No. 2, section 1e, requires State agencies to "[d]etail and justify every instance where a proposed rule exceeds the requirements of federal law or regulation. State agencies shall, when promulgating proposed rules, not exceed the requirements of federal law except when required by State statute or in such circumstances where exceeding the requirements of federal law or regulation is necessary in order to achieve a New Jersey specific public policy goal." This directive establishes a focus and approach to the comparison with Federal law that the APA requires all State agencies and the Department to conduct for rulemaking.

As the commenter points out, the conditions and circumstances of New Jersey and its citizens can be unique to the State. Consequently, both the APA and Executive Order No. 2 acknowledge that there will be times when it is absolutely appropriate for the Department to promulgate standards that are more stringent than Federal standards, either because New Jersey law so requires or because doing so is necessary in order to achieve important public policy goals for the State.

46. COMMENT: There are probably many instances where Department procedures could be more clear. For example, Department forms may have increased in complexity over the years, some information may be requested redundantly and some permits could, perhaps, be merged. The Department, however, should keep in mind that it is not a "Department of Environmental Permitting," and its mission should not be to smooth the

path from developmental permit applications to development. Central to the idea of protection is that one must often say "no." The Department should not look at "process improvement" as making it easier to get to "yes." (22)

RESPONSE: The Department undertakes various efforts to assist the regulated community in the permit application and review process. For example, in accordance with N.J.S.A. 13:1D-111, the Department develops and makes available technical manuals relating to its various environmental permits. The Department also provides checklists, identifying the application steps and submissions required under the respective permitting program rules. Checklists and applications are made available through the Department's website. The Department often assigns case managers to assist applicants with the permit process, and to coordinate permitting across various Department programs.

The Department convened the Permit Efficiency Review Task Force in 2008 and, in response to its recommendations (see http://www.state.nj.us/dep/permittf/documents.html.), has undertaken various initiatives to improve outreach for rulemaking and to streamline and improve the permit application and review process. The Department is committed to upgrading its information technology infrastructure to support electronic submission and processing of permit applications and associated reports. The Department is in the process of increasing its network capacity, and is accelerating its efforts to design and develop electronic permitting and reporting services. Recent efforts include, for instance, implementation of an electronic water use and transfer reporting program by the water supply program to facilitate data management, eliminate the use of paper forms, reduce data errors, improve tracking and reporting of data, and make data available in a more timely fashion.

The Department believes process improvements that facilitate the issuance of permits that are consistent with the applicable standards and that are issued in a coordinated and timely fashion are beneficial to the regulated community, the Department, and the environment. Streamlining permitting will conserve the resources of all involved and maintain proper focus on achieving substantive environmental protections. As the

Permit Efficiency Review Task Force's recommendations and Governor Christie's Executive Orders recognize, the process of obtaining a permit from the Department should not stand in the way of development that is otherwise allowable under applicable environmental protection law and standards.

47. COMMENT: Although many of the State's environmental regulations could be improved, the Department ought not curtail any protections or delay any rules based on the Governor's Executive Orders. (22)

RESPONSE: The Department, in order to inform the reviews of pending proposed rules being conducted by the Department and the Red Tape Review Group established under Executive Order No. 3 issued by Governor Christie on January 20, 2010, extended or reopened the public comment period for certain pending proposals. (See Notice of extension or reopening of comment periods and informal stakeholder meetings for pending Department of Environmental Protection proposals suspended under Executive Order No. 1 (2010), http://www.nj.gov/dep/rules/notices.html, 42 N.J.R. 642(a).) In accordance with Executive Order Nos. 1 and 3, the Red Tape Review Group's task is, among other things, to examine various proposed administrative rules and regulations by a number of State agencies prior to their adoption and make detailed recommendations to the Governor to rescind, repeal or amend those rules. Based on those recommendations, the Commissioner of the Department will determine whether or not to proceed with adoption or amendment of the Department's affected proposals.

The Executive Orders and the Red Tape Review process expressly recognize that some rules must be adopted in order to prevent an adverse impact to public safety or security or public health; prevent prejudice to the State with regard to receipt of funding or certifications from the Federal government; allow State agencies to exercise their essential powers, duties and functions; and comply with any judicial deadline. Rule proposals that would result in such adverse impacts if adoption were delayed therefore were not suspended. Executive Order No. 2 also directs State agencies to implement the "common sense principles" in all rulemaking while keeping in mind the core missions of

the agency; public health, safety, welfare and the environment; and the agency's underlying regulatory objectives. In determining whether to proceed with its rule proposals and for all future rulemaking, the Department will necessarily take all of these factors into consideration.

48. COMMENT: The Department's notice and comment procedure, the informal stakeholder process, and the Red Tape Review Group process created by Governor Christie's Executive Order No. 2 do not comply with the rulemaking requirements of the New Jersey Administrative Procedure Act (APA). Web posting and reliance on the authority of Governor Christie's Executive Order Nos. 1 through 3 cannot supersede or replace APA requirements. All 12 proposals were proposed pursuant to and in accordance with the APA requirements. The Department may not - after the fact - revise these procedures. (48)

RESPONSE: As the commenter acknowledges, this rulemaking, as well as the other proposals to which the commenter referred, were proposed in accordance with the Administrative Procedure Act (APA), N.J.S.A. 52:14B-1 et seq. On January 20, 2010, Governor Christie issued a number of executive orders. Executive Order No. 1 (EO1) suspended for 90 days more than 150 then-pending proposals of various New Jersey agencies, including 12 proposals of the Department. EO1 states that one of the Governor's priorities is to establish, under the direction of a Red Tape Review Group, a "commonsense" approach to the promulgation of rules. The commonsense principles are described in Executive Order No. 2 (EO2), and the Red Tape Review Group is established under Executive Order No. 3 (EO3). The purpose of the suspension was to afford the Red Tape Review Group the opportunity to examine the suspended rulemakings and make recommendations as to those proposed rules it determines are "unworkable, overly-proscriptive or ill-advised" (see EO1, 4th whereas clause). EO1 directed that the suspension be undertaken in a manner consistent with APA rulemaking requirements, and specifically exempted from suspension any proposed rulemaking for which the failure to adopt would adversely impact public safety or security; adversely

impact public health; prejudice the State with respect to receipt of monies from the Federal government or the ability to obtain any certifications from the Federal government; prevent the application of powers, functions and duties essential to the operations of the relevant State agency; or adversely impact compliance with any judicial deadline.

Both EO2 and EO3 stress transparency and the involvement of stakeholders and the public in agency rulemaking, which is a fundamental tenet of the APA. Accordingly, the Department determined it was appropriate both to extend the formal comment period on its suspended proposals and to also hold stakeholder meetings to facilitate informal discussions of the rulemakings in consideration of the purposes of the executive orders.

On February 3, 2010, the Department filed for publication in the New Jersey Register a notice of the extension or reopening of the comment period on the 12 suspended rulemakings to March 15, 2010. The notice appeared in the March 1, 2010, New Jersey Register (see 42 N.J.R. 642(a)). The Department posted the notice on its website on February 4, 2010.

The notice provided an additional period for public comment on each of the rulemakings beyond that required by the APA. The notice did not change the content of the original proposals in any way. While not precluding additional comment on any aspect of the pending proposals during the extended/reopened comment period, the Department sought through the notice to focus any additional comments submitted on the purposes of the rules review set forth in the executive orders. The Department also announced in the notice that it would be scheduling stakeholder meetings on the proposals and that the dates for the meetings would be posted on the Department's website. The schedule of the stakeholder meetings was subsequently posted on the website on February 22, 2010. The first of the stakeholders meetings was held on March 2, and the last on March 11, 2010.

The stakeholder meeting regarding this rulemaking is described above in the introductory section of this adoption. Public comments for the administrative record were accepted in writing during the original public comment period and during the additional comment period that ended March 15, 2010. As with any rulemaking, and as

contemplated by the APA, the Department has reviewed, considered, summarized and is responding in this adoption to all formally submitted comments received during the entirety of the public comment period. In conclusion, DEP did not "revise the procedures after the fact" but, rather, supplemented the statutorily required rulemaking procedures in order to facilitate public input into the review of the rules required by the executive orders.

49. COMMENT: The Department's web post states the following: "[Note: The Department prefers electronic submissions in order to facilitate timely review of comments to meet the timeframes for action in the Executive Orders.]" (48)

The time restriction (in other words, the timeframe for action pursuant to Executive Order Nos. 1 through 3 and the Red Tape Review Group review process) cannot replace or supersede the requirements of the APA. The March 15 deadline is arbitrary and not in accordance with APA requirements. (48)

RESPONSE: The Administrative Procedure Act prescribes minimum notice requirements to ensure that adequate opportunity for public input on a proposed rule is provided. As indicated in response to comment 48 above, the proposals for which the Department extended or reopened the comment period for purposes of the review initiated by the executive orders satisfied the notice and public comment requirements of the APA at the time they were originally proposed. The notice provided an additional period for public comment on each of the rulemakings beyond the minimum required by the APA. The March 15, 2010 close of the additional comment period was established so that comments related to the purposes of the executive orders would be received within the 90-day timeframe (ending April 20) established by Executive Order No. 1 for the Red Tape Review Group to conduct its review of the suspended proposals so that it might thereafter make its recommendations.

50. COMMENT: The substantive requirements of Executive Order Nos. 1 through 3, particularly the requirements to conduct cost/benefit analysis and to consider cost/benefit

analysis as a basis for regulatory decisions, is ultra vires and not authorized by either the APA or the enabling authorities pursuant to which each of the 12 rules were proposed. (48)

RESPONSE: The Administrative Procedure Act requires that each proposed rulemaking include a description of the expected socio-economic impact of the rule, as well as a regulatory flexibility analysis of impacts on small businesses, a jobs impact statement, an agriculture industry impact statement, a housing affordability impact statement, and a smart growth development impact statement. See N.J.S.A. 58:14B-4. See also the Rules for Agency Rulemaking, N.J.A.C. 1:30-5.1. In addition, the APA requires that a Federal standards analysis must be included in each proposal and adoption. See N.J.S.A. 52:14B-23, and N.J.A.C. 1:30-5.1. Neither the APA nor the enabling authority for this rulemaking preclude an analysis of the costs and the benefits of a proposed rule as part of the APA-required impact analyses.

51. COMMENT: The "reopening" of the public comment period and retroactive application of new procedures, standards, and decision criteria established by Executive Order Nos. 1 though 3 is ultra vires, not authorized by law, and inconsistent and in violation of law. This includes the APA requirements as well as the enabling statute for each rule proposal. (48)

RESPONSE: As indicated in prior responses, the procedure followed for this rulemaking, including the reopening of the comment period to provide additional opportunity for public comment and the request to focus the additional public comments on the purposes of the rules review set forth in the executive orders, is consistent with the rulemaking requirements of the Administrative Procedure Act. Seeking additional public input on, for example, the potential costs and benefits of the rulemakings in a more focused way as contemplated by the executive orders did not result in new procedures, standards, and decision criteria being imposed. Rather, the extended comment period and stakeholder meetings supplemented the statutorily required rulemaking procedures for

public comment and participation in rulemaking. The commenter has not explained how providing an opportunity for additional public comment, or having the Department consider those additional comments, violates the APA or the enabling statutes for this or any of the affected rulemakings. Consequently, the Department is not able to further specifically address this aspect of the comment.

52. COMMENT: The Department's application of the provisions of Executive Order Nos. 1 through 3 to the subject rule proposals would violate the procedural and substantive requirements of Federal environmental laws and the delegation agreements under which New Jersey implements Federal laws. These laws include, but are not limited to the Safe Drinking Water Act, the Coastal Zone Management Act, the Resource Conservation and Recovery Act (RCRA), the Clean Water Act, and the Clean Air Act. The same violations arise by the Department's after the fact "reopening" of the public comment procedure, as part of which this comment is submitted. (48)

RESPONSE: Several of the programs for which proposals were suspended under Executive Order No. 1 and for which the Department reopened or extended the comment period are administered by the Department in conjunction with equivalent Federal programs under independent State statutory authority, as allowed by the applicable Federal statute. Others are programs that have been delegated to the Department by the Federal government, again in accordance with the applicable Federal statute. The Department’s decision to allow further opportunity for public comment in order to obtain comments focused on the directives contained in the executive orders is not barred by the New Jersey Administrative Procedure Act and does not violate any Federal environmental law related to any of the Department’s programs that implement the affected rules. The Federal statutes and delegation agreements do not preclude the Department from seeking public input determined to be appropriate before taking regulatory action. Similarly, the Federal statutes and delegation agreements do not preclude the Department from considering the impacts of the rulemaking on the regulated public for purposes of determining the best way to implement the required standards.

53. COMMENT: The "reopening" process and the provisions of Executive Order Nos. 1 through 3 violate Federal funding agreements and the National Environmental Partnership Performance Agreement (NEPPS). The Department may not substitute the provisions of the Executive Orders and the Red Tape Review Group review process for the requirements of Federal law, regulation and funding agreements. (48)

RESPONSE: Federal funding agreements and the National Environmental Partnership Performance System (NEPPS) do not establish requirements for the rulemaking process. NEPPS has two major components, the Performance Partnership Agreement (PPA) and the Performance Partnership Grant (PPG). The PPA focuses mainly on activity commitments that the Department makes to earn the overall PPG from the U.S. Environmental Protection Agency. While some of the commitments may relate generally to the development of rules and expected timeframes, neither the PPA nor PPG deals with the procedures for rulemaking. Accordingly, the PPA and PPG do not preclude the Department from seeking and considering public comments related to the purposes of the rules review set forth in the executive orders.

54. COMMENT: Based on the concerns expressed by the commenter in comments 48 through 53 above, the Department should withdraw this sham "reopening of the public comment process." This "reopening" process is not in compliance with procedural notice/comment requirements of applicable law. (48)

55. COMMENT: The "common sense principles", standards, criteria, and informal process established by Executive Order Nos. 1 through 3 are not authorized by law, can have no legally binding effect, and expressly violate State and Federal law. Accordingly, this "proposal" must be withdrawn. (48)

RESPONSE TO COMMENTS 54 AND 55: As explained in the responses to comments 48 through 53 above, the Department's actions to propose and adopt this rulemaking meet

the requirements of the APA, and do not violate the enabling statutes or applicable Federal law.

56. COMMENT: The "Red Tape Review" process is an informal process that is not on the record. This process is not transparent and not authorized by law. It may not be considered or relied upon in any way for final agency regulatory decisions regarding the subject rule proposals. No information considered or decisions reached during that process may be considered as part of the administrative record of the subject rule proposals, and none of it can be relied on as a basis for final regulatory decisions by the Department. (48)

57. COMMENT: The stakeholder process announced for this proposal is an informal process that is not on the record. This process is not transparent and not authorized by law. It may not be considered or relied upon in any way for final agency regulatory decisions regarding the subject rule proposals. No information considered or decisions reached during that process may be considered as part of the administrative record of the subject rule proposals, and none of it can be relied on as a basis for final regulatory decisions by the Department. The Department should withdraw this proposal and abandon this process. (48)

RESPONSE TO COMMENTS 56 AND 57: As indicated in the response to comment 48, the process followed by the Department in this rulemaking, including the additional public comment period, meets the requirements of the Administrative Procedure Act. The extended/reopened comment period and the informal stakeholder meetings were intended to facilitate receipt of additional public input on the 12 Department proposals suspended under Executive Order No. 1 in consideration of the purposes of the executive orders as enumerated therein. The notice extending and/or reopening the comment period on the suspended rulemakings specifically noted that the stakeholder meetings were not public hearings and that testimony on the proposals was not going to be accepted at them. The stakeholder meetings were open to all, and their purpose was to

facilitate informal discussion of the rulemakings. The stakeholder meeting regarding this rulemaking is described above in the introductory section of this adoption. Public comments for the administrative record were accepted at the formal public hearing, and in writing during the original public comment period on each of the proposals, and in writing during the additional comment period that ended March 15, 2010. As with any rulemaking, and as contemplated by the APA, the Department has reviewed, considered, summarized and is responding in this adoption to all formally submitted comments received during the entirety of the public comment period.

Solar panels

58. COMMENT: The expansion and enhancement of solar energy in the State is strongly supported. The peak energy demand in New Jersey occurs in mid- to late summer, when shore communities reach their maximum populations. The peak in solar energy production coincides with this period of high energy demand, in contrast to offshore wind energy production, which is at its weakest during summer months, according to NOAA weather charts. Solar energy generation is therefore particularly important for meeting New Jersey's peak energy demand, especially at high load centers in coastal areas. (50)

59. COMMENT: The Department's efforts to assist the State in meeting its renewable energy goals are supported. The proposed amendments relating to solar energy will encourage appropriate development while protecting natural resources. (23)

RESPONSE TO COMMENTS 58 AND 59: The Department acknowledges these comments in support of the rule.

60. COMMENT: Throughout the proposal the terms "solar panel" and "solar panel development" are used. Solar panels include a tracking system, charge controller, inverter, underground connections, transformers, and a balance of plants. The permit-by-

rule and general permit should include all parts of a solar panel system as noted above and not just the panels. (28)

RESPONSE: The terms "solar panel" and "solar panel development" include all parts of the solar panel system identified by the commenter and not just the panels themselves.

61. COMMENT: The Department should add a permit-by-rule or general permit for the construction of commercial grade parking lot canopy solar panel structures installed over maintained lawn or other existing impervious surfaces. Although they are larger than single family home or duplex solar panel systems, if installed over existing maintained landscaped or impervious surfaces, the environmental impact is minimal. (37)

RESPONSE: The construction of commercial grade parking lot canopy solar structure panels over existing impervious covers does not require a Waterfront Development or CAFRA Permit. Under the Flood Hazard Area Control Act rules, the installation of solar panels over existing impervious cover would not trigger the Riparian Zone standards as there is no existing vegetation to protect. In order to prevent the support posts from creating an obstruction to the flow of water during a flood event, and thereby exacerbating flooding, solar panels cannot be installed in a floodway. However, the permit-by-rule at N.J.A.C. 7:13-7.2(b)9 applies to the construction of open structures, such as solar panels, outside of the floodway. Construction of commercial grade parking lot canopy solar structure panels over maintained lawn or landscaped areas implies the conversion of the lawn or landscaped area to a parking lot, with attendant impacts on water quality and near-stream habitat. Therefore, a case-by-case review is required.

Accessory Structures to both wind and solar energy developments

62. COMMENT: For wind and solar energy developments that are exempt, permitted-by-rule or authorized under a coastal general permit, accessory structures on-site and new or enhanced transmission lines off-site should only be permitted if they are de minimus.

(24)

RESPONSE: Because the size of the wind or solar energy development is limited under the exemption and permit-by-rule, the associated accessory structures are anticipated to also be limited in scope and impact.

Scientific basis/Cited references for wind turbines

63. COMMENT: The Department has made an important effort to protect natural resources while developing renewable energy resources. Broad, unregulated development of wind power projects in the sensitive and important habitats of the CAFRA area could lead to serious and irreversible damage to a wide range of avian and bat species, as well as damage to or the loss of habitat necessary to support those species. Use of data and studies about wind development and the wildlife resources in New Jersey's coastal areas is particularly important when considering the development of wind power projects. The use of existing scientific literature to develop thresholds for types of wind power projects that are acceptable given the importance of protecting wildlife and habitat by the Department is applauded. (20)

RESPONSE: The Department acknowledges this comment in support of the rule.

64. COMMENT: The references to scientific literature provided in the general summary of the proposal are based on conjecture rather than empirical findings. For example, the statement "cumulatively, as the number and size of wind turbines increase along the coast the greater the potential for habitat loss and habitat avoidance" is not substantiated by the literature and no references are cited. The Department suggests that there have been large-scale significant impacts to birds without providing empirical examples or describing the true magnitude of impacts. Furthermore, it is important to note that the Manville 2004 report is based on the author's hypotheses regarding what might occur if turbines were built, not on empirical findings. It has been six years since the Manville

document was written and it has since been demonstrated that his hypotheses were incorrect. Many empirical studies have appeared since 2003, which do not suggest cumulative impacts. The rule document must be updated to reflect what has been learned since the unreviewed Manville report appeared. (13)

RESPONSE: The commenter has not identified the empirical studies conducted since 2003, other than the Manville paper, that suggest wind turbines do not have cumulative impacts on birds. It is the Department's experience that many of these studies rely on data collected from inland areas that have little in common with coastal areas in terms of their importance to bird populations as well as other wildlife, including marine mammals, benthic species and fish. The Atlantic County Utilities Authority site in Atlantic City is the only site in a coastal area in the United States where impacts to birds and bats have been studied and data is readily available. The empirical study performed at the Atlantic County Utilities Authority project has revealed higher than national average bird and bat kills. In fact, mortality was much higher for bats at the Atlantic County Utilities Authority site than sites in other landscape types other than the mesa/desert. Despite this data, the Department acknowledges that information on impacts in the coastal zone is limited. As further information becomes available, both through outside empirical studies of impacts in the coastal zones of other regions and through information developed from turbines in New Jersey, the Department will determine if any adjustments to the rules are appropriate.

65. COMMENT: The Hodos study of blade visibility is based on research of wind turbines that were manufactured in the 1980s (KeneTechnical 56-100-100 kilowatt turbines). The study turbines had a rotor length of 28 feet, a rotor width of one foot and rotation rate of 72 rotations per minute. This study was conducted in a laboratory on scale models as opposed to real turbines. This research is not applicable to modern utility sized turbines that have rotor lengths of 150 feet, rotor widths of 8 feet and rotation rates of 15 to 20 rotations per minute. While the Hodos report is interesting, it cannot be

applied directly to modern turbines. The Department needs to clarify that it is basing its conjecture on turbines that will never be deployed in New Jersey. (13)

RESPONSE: In developing rules governing the requirements applicable to wind turbines in the coastal zone, the Department analyzed the impacts that can be caused by the full range of turbines that could be placed in the State in order to determine potential impacts to the State's wildlife, including birds and bats. The Department then looked at the impacts associated with particular types and sizes of turbines to determine what level of permit review was appropriate for the differing classes of turbines. The Department's determinations resulting from that analysis are reflected in the proposal summary for the permit-by-rule and general permits being adopted at this time. The rules are designed to take into account the broad range of turbines that might be constructed in the State; they do not attempt to regulate only those types of turbines that the Department believes may be most likely to be the subject of permit applications in the future. The summary provided a synopsis of the impacts that can occur as the result of placement of a wind turbine. The Hodos report provided information relevant to the impacts associated with placement of wind turbines. While the Department agrees that motion smear or motion blur is not as much of a problem with larger, slower-moving turbines, invisibility of blade tips can occur with some of these turbines. The Department believes that reference to and reliance upon the information in the Hodos report was entirely appropriate.

66. COMMENT: It is troubling that the scientific information contained in the proposed rules and technical manual relating to birds and wind turbines has not been peer reviewed. A true peer review by scientists is needed to separate fact from myth. The most objectionable theme in the rules and accompanying documents is the fact that there is no objective overview regarding the post-construction studies that have been conducted at wind projects throughout the United States. At least 40 post-construction studies have been conducted at wind plants in the United States including two years of study at a coastal wind energy facility in New Jersey. The results of all of those studies show that very few birds collide with turbines and that none of the modern wind projects with

turbines greater than 250 feet in height built after 1995 that have been studied show biologically significant impacts. The omission of these facts reduces the credibility of the proposed rules and technical manual. (13,18)

RESPONSE: The Department has considered the many post-construction studies conducted at wind facilities throughout the country, including peer reviewed studies. Many of the turbines studied were constructed inland, so the results are not as applicable to the coast. However, the importance of taking into account all aspects of the area where wind turbines are sited, particularly the prevalence and habits of local and migratory bird populations in the area, is illustrated by the Altamont Pass wind farm where failure to take into account bird flight paths and behavior resulted in significant impacts and avian deaths. Since publication of the proposal, post-construction data for the time period August 2007 to August 2009, adjusted for searchable area, observer efficiency and scavenger removal, for the wind turbine facility located in Atlantic City became available. That data indicates that the bird and bat mortality at that coastal location is greater than the mortality at other, inland sites around the country. This rule, along with all Department rules, was promulgated in compliance with the Administrative Procedure Act. As part of that process, the proposed rule and the technical manual were made available to all communities (including the scientific community) and individuals for review and comment.

67. COMMENT: The general summary of the proposal references the Altamont Pass wind farm which was constructed in the late 1970s/early 1980s. It was the first large scale utility-grade wind farm in the United States and it was installed, unknowingly or unwittingly, in a flyway zone. The large-scale utility wind industry learned from that experience. What is not mentioned in the proposal summary is that 400 miles away in San Gorgonio Pass along Interstate 10, are 3,100 wind turbines, most of which were installed on freestanding lattice towers. Shortly after the project's completion, a 1986 study found that 69 million birds flew through the San Gorgonio Pass during spring and fall migration. During both seasons, only 38 bird carcasses were found, representing just

0.00006 percent of the migrating population. Currently, the wind farm offers the only tour of a working wind farm in the world. If bird kills were an issue there probably would not be a tour that showcases dead birds lying on the ground. If there is a specific reference to Altamont Pass for the negative aspects of that very large scale commercial installation, then perhaps the positive aspects of the San Gorgonio Pass project should be noted as well. (11, 14)

RESPONSE: The Altamont wind farm has been used throughout these documents as an example of what can happen when wind farms are improperly sited. Since the coastal region is a sensitive area regarding wildlife, proper siting is paramount to the reduction of impacts on wildlife.

68. COMMENT: The Department's proposal references Altamont, California's wind farm. Has the Department obtained information on what is currently happening at this wind farm since mitigation has taken place? (14)

RESPONSE: The Department assumes that by "mitigation" the commenter is referring to the legal actions that have taken place over the past few years involving Altamont. The Department has followed the progress of legal actions at this site. The settlement agreement calls for reducing mortality of hawks, eagles and owls by 50 percent within three years (starting in 2007). It appears that the high mortality rates are still an issue and this reduction has not been achieved. Mortality remains high compared to other wind installations and is estimated at 7,300-9,600 birds per year. This is due in part to the slow response of the wind companies in decommissioning problem and derelict turbines. However, the fact that this site was poorly chosen is something that cannot truly be resolved and it is likely mortality rates will continue to be higher there than at other inland sites.

69. COMMENT: The scientific basis for the rule must be comprehensive, unbiased and based on the most current information. The following four areas are of concern:

1. The Department's cited documents appear to present only negative impacts of wind turbines on birds. The environmental impacts of wind energy are complex, and include societal benefits such as air quality, energy independence, economic growth, and climate change impacts on the environment from sea level rise to endangering wildlife and humans. This complexity necessitates a comprehensive and balanced approach to ensure all environmental impacts are considered and mitigation efforts enacted;

2. Nearly all references in the documents are from studies of large wind farms which may be irrelevant in New Jersey. With limited wind resources in New Jersey, comparing potential wind installations in the State to large wind farms in studies with several thousand turbines seems inappropriate. While the proposed "prohibited areas" in the regulations offer attractive conditions for wind energy, the land available is unlikely to accommodate large wind farms;

3. The cited documents appear inconclusive regarding avian mortality and seem to omit mitigation techniques that may reduce bird mortalities. Additional research may be needed to ensure the supporting references are comprehensive and accurately represent the environmental danger. There are other reports that differ significantly from those included in the Department cited references;

4. The cited documents may need to be updated. For example, the rule proposal summary states that "these studies are essential since wind turbines are a new use in the coastal zone and internationally and their effects not clearly understood." In 2008, 120GWs of wind energy had been installed worldwide; wind energy is not "new." While wind turbines in New Jersey's coastal zone will be a relatively new use for New Jersey and data needs to be accumulated to assess the actual impact, it is not new internationally. Another example of cited documents that may need updating is the reference to a bat study conducted in 1939. This study was conducted in Washington D.C. over 70 years ago. It is hard to believe that this study has any relevance today. In the past 70 years, the footprint and topography of Washington D.C. has changed. The validity of this study is questionable. Is there more current data available on bats? (14, 44)

RESPONSE: Although the Department agrees with the commenter that wind generated energy can provide many benefits to society, as described in the introductory paragraphs of the proposal summary (see 41 N.J.R. 3168; September 8, 2009), the Department believes that wind energy development in New Jersey must proceed in a responsible manner. The Department has an obligation to protect the wildlife resources of the State and is proceeding with that mission in a thoughtful manner in an effort to have a balanced approach towards renewable energy development.

The Department is aware of interest in large scale wind farm permit applications for the Delaware Bay and State waters. In addition, the cumulative impact of many smaller installations must be considered. Although such installations may be operated by different entities, the landscape they will occupy is used as a contiguous unit by many species.

As indicated in the proposal summary, the Department agrees that more information needs to be developed to fully understand the impacts of the wind turbines in the coastal zone. There are scores of documents relating to wind power, but the Department's review indicated that many of the results in those documents were not transferrable to the coastal region. It was recognition of the need to develop more information to better understand potential impacts to the State's environment that led the Department to not allow unfettered placement of wind turbines in sensitive areas, particularly in light of the experience at the Altamont Pass Wind Farm, referred to in the proposal summary, where failure to take into account bird flight paths and behavior resulted in significant impacts and avian deaths. As further indicated in the proposal, as additional information becomes available, the Department will act to further streamline the process for approval of wind turbines where information indicates that is appropriate. In addition, the proposed rules do refer to mitigation techniques, such as changing the cut-in speed of a turbine to reduce bat deaths during migration periods.

The Department stands by its assertion that wind power in the coastal region is a "new use" since there are still very few turbines in this area and those that exist were recently erected. In addition, while wind power as a whole is not a "new" technology, its impact in coastal regions is still not well understood. The reference to Allen's 1939

observations regarding the flight altitude of bats is still relevant today. In fact, there is a paucity of bat related studies so it is necessary to rely upon previous studies regardless of their age to compile data. Allen's observations support the fact that bats fly/migrate at altitudes lower than existing structures. More recently, this observation is supported by observations by Annette Scherer of the United States Fish and Wildlife Service, where she found bats roosting on buildings in Atlantic City at heights far below the tops of buildings.

70. COMMENT: All documents cited in the proposal center on other states. New Jersey's topography and native avian species are different than most of the studied areas. This alone casts significant doubt on the conclusions made in the proposal. The only study of the effects of wind turbines on avian mortality in New Jersey is the study currently being conducted by the Atlantic County Utilities Authority in Atlantic City. (14)

RESPONSE: New Jersey's coastal area is considered part of the globally significant Atlantic Coast migratory corridor and as well as critical habitat to numerous resident species. For example, the Delaware Bay and Bayshore have received international recognition by a number of organizations. This area is recognized as a Western Hemisphere Shorebird Reserve Network site of international importance; a Wetland of International Importance under the Ramsar Convention on Wetlands of International Importance (an international treaty for the conservation and sustainable utilization of wetlands); and BirdLife International and Audubon recognize this area as an Important Bird Area of global significance. Therefore, pre and/or post construction monitoring is required to establish the flight patterns and distribution of avian species and bats and impacts of the operation of the wind turbines on these species. The Department is not aware of any studies conducted at wind turbine facilities in New Jersey other than the Atlantic County Utilities Authority site. The Department did consider the Atlantic County Utilities Authority study in developing the rule and technical manual.

71. COMMENT: The Department must re-evaluate the conclusions presented in the technical manual and rules in light of new documented information such as that found in the following list of references:

"Avian Mortality Associated with the Top of Iowa Wind Farm" Dr. Rolf Koford, Iowa State University, Zenner, Hancock (2004)

"Putting Wind Power Effect on Birds in Perspective" by Sagrillo, 2003

Bird Mortality at Rotor Swept Area Equivalents, Altamont and Montezuma Hills, CA." by Howell, 1992

"Annual Bird Fatalities by Source" by Wallace P. Erikson: Western Ecosystems Technology, Inc.

"Assessment of Avian Mortality from Collisions and Electrocution" Chapter 1, "Interactions with Wind Turbines" by Melinda Dorin and Linda Spiegel, June 28, 2005

"Radar Images of Migrating Birds at the Nysted Wind Power Plant-Denmark" from USDOE Energy Efficiency and Renewable Energy

"Effects of Wind Turbines on Birds and Bats in Northeast Wisconsin" by Howe, Evans and Wolf, November 2002

"Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting and Mortality Information from Proposed and Existing Wind Developments" by West, Inc. December 2002. (14)

RESPONSE: The Department has reviewed the documents submitted as citations by the commenter. Many were part of the breadth of literature that the Department reviewed

when drafting the proposed rule amendments. In summary, the areas reported on in the documents citing low mortality rates are not analogous to the coastal area. This is borne out when one compares the much higher corrected mortality estimates at the Atlantic County Utilities Authority site to the numbers cited in these documents. The Department appreciates that many other sources can impact bird populations more than wind turbines, in large part because there are so many more other sources, such as buildings, as compared to wind turbines, in New Jersey's landscape. However, that does not mean that the direct and indirect impacts of wind turbines should be ignored. On the contrary, it highlights the importance of being aware of and controlling for impacts from new sources since many of the species populations are already under so much pressure due to other anthropogenic factors.

72. COMMENT: Scientific evidence shows that buildings and glass windows kill more than 5,000 times more birds than wind turbines. According to Wallace P. Erickson, Western EcoSystems Technology, Inc., wind turbines kill 5000 times more birds than buildings and glass windows. Communication towers, pesticides, vehicles and high tension lines are some examples of other uses that are greater threats to avian populations, suggesting there is an "acceptable avian mortality rate" when considering other public benefits. Another analogy can be found in the airline industry. Over the past 30 years, there have been 110,000 reported bird strikes to airplanes. The United States Bird Strike Committee estimates that only 20 percent are reported. Using this percentage, there was a possible 550,000 bird strikes in 30 years or over 18,000 per year. (14)

RESPONSE: The Department appreciates that many other sources can impact bird populations more so than wind turbines, in part because there are so many more of them but that does not mean that the direct and indirect impacts of wind turbines should be ignored. According to Wallace P. Erickson, Western EcoSystems Technology, Inc., buildings and glass kill 5,000 times more birds than wind turbines.

73. COMMENT: None of the studies used to form these rules address the environmental impact to coastal New Jersey from rising sea levels or climate change. The studies only look at the direct effects to species from the turbines, failing to assess the impact that climate change will have on them and their habitats. (44)

RESPONSE: The adopted amendments are intended to facilitate the construction of wind turbines and installation of solar panels in the coastal zone. As stated in response to comments 19 through 21 above, the adopted amendments improve the ability to install wind turbines and solar panels by providing permits-by-rule and general permits, reducing setback requirements and exempting wind turbines from review under the Coastal Zone Management rules' High-rise structures rule. Further, the goal of the Energy Master Plan is, in part, to address climate change and the adopted amendments will facilitate implementation of the Energy Master Plan.

Critical environmental habitats

74. COMMENT: The State together with conservation organizations has created a network of preserved habitat for birds that makes southern New Jersey one of the most important areas for bird conservation in North America. For this reason, the protective mechanisms and prohibitions in the proposed rule relating to the siting of wind turbines in the Delaware Bay, along the Delaware Bayshore and on the Cape May peninsula are strongly supported. (47)

RESPONSE: The Department acknowledges this comment in support of the rules.

75. COMMENT: It is recommended that wind turbines within the CAFRA zone not be placed in or near the following critical environmental habitats: Federally and State-listed species occurrences/habitats; species of special concern occurrences/habitat; National Wildlife Refuges; State Wildlife Management Areas; County Parks; Wild and Scenic Rivers; Colonial waterbird sites; Critical bird migration areas; Service designated priority

wetlands under the Emergency Wetlands Resources Act of 1986 (16 U.S.C. 3901-3932) as amended; and Natural Heritage Priority Sites. (35)

RESPONSE: To qualify for the permits-by-rule and coastal general permits for wind turbines, no portion of the wind turbine including blades, tower and site disturbance can be located in wetlands or wild and scenic river corridors. The permit-by-rule and coastal general permit at N.J.A.C. 7:7-7.30 also require that no portion of the turbine be located in an area mapped as threatened or endangered species habitat on the Department's Landscape Maps of Habitat for Endangered, Threatened and Other Priority Wildlife. The coastal general permit at N.J.A.C. 7:7-7.31 requires compliance with the endangered and threatened wildlife and plant species rule. Further, wind turbines 200 feet in height and taller or having a cumulative rotor swept area of 4,000 square feet or greater cannot be located in areas mapped on the Department's Large Scale Wind Turbine Siting Map which includes colonial waterbird sites and critical bird migration areas. These criteria address the commenter's concerns regarding placement of wind turbines within, and in some instances within 50 feet of, the areas described. Due to the small size of these projects and the interest in promoting renewable energy, the Department does not believe it is necessary to review each such project when located near but not in one of these areas.

Wind turbines that do not meet the permit-by-rule and coastal general permit standards require an individual permit. Through the individual permit review, the Department would review the proposed wind turbines under the applicable special area rules such as wetlands, public open space, endangered and threatened wildlife and plant species habitat, critical wildlife habitat, and wild and scenic river corridors.

76. COMMENT: It is recommended that the Department support a coast-wide research effort to produce a wind "zoning" map/GIS layer based on ecological risk that would incorporate ongoing surveys and studies by Federal and State agencies, and local organizations. Data and information obtained from studies in coastal areas of New Jersey, including pre- and post- construction bird and bat monitoring, are essential to:

determine if continued operation of any onshore wind farm is likely to adversely affect Federally and State-listed species, and migratory birds and bats; review wind farm proposals for siting in coastal areas; and provide technical assistance to project proponents for avoidance or minimization of potential adverse impacts. (35)

RESPONSE: The Department carefully evaluated the land in the coastal zone and prepared a map that identifies specific areas on land where wind turbines 200 feet in height or taller or having a cumulative rotor swept area greater than 4,000 square feet are unacceptable due to the operational impacts of the turbines on bats and birds. This map was produced by the Department's Division of Fish and Wildlife in an effort to minimize the impacts of wind turbine operation to birds and bats. The Department will revise the map, as appropriate, based on new information on species occurrence, new information on appropriate buffers, or new information on impacts developed from ongoing monitoring or from published and unpublished studies or data as described in the Coastal Zone Management rules, N.J.A.C. 7:7E-7.4(r).

77. COMMENT: The proposed rules restrict development and eliminate the prospect of any wind energy development in areas that hold the greatest potential for such development. Of greatest concern is the blanket prohibition on development in wetland areas. Rather than permitting wind energy facilities in wetlands on a case-by-case basis, the Department through these rules has completely eliminated this area for wind development. The Department should calculate the tons of potential carbon emission reductions inherent in such a large area. (13)

RESPONSE: The permit-by-rule and coastal general permits provide a streamlined approach to the permitting of wind turbines in the coastal zone. Therefore, to qualify for these types of permits, no portion of the turbine, including blades, tower, foundation, and site disturbance, is permitted within wetlands. However, the energy facility use rule does not address the construction of wind turbines in wetlands. In the case of an individual permit application for the construction of a wind turbine(s), the standards of the existing

wetlands rule, N.J.A.C. 7:7E-3.27, would apply.

78. COMMENT: The rules appear to have been developed in a vacuum as they have a very limited and narrow focus. The rules do not address the full extent of environmental problems resulting from global warming and air and water pollution caused by traditional energy and that renewable energy addresses the problems. (12)

79. COMMENT: The discussion of climate change and global warming in the proposal summary as it related to the use of renewable energy including wind and solar energy generation ignores the myriad of significant impacts to wildlife and humans that result from fossil fuel based electric generation. Climate change is only one of the many reasons for using wind and solar rather than coal, natural gas and oil-fired electric generation. To be complete and credible, the proposed rules and technical manual must include a description of all the negative impacts of fossil fuel generated electricity in New Jersey and at other locations that impact the New Jersey environment and citizens. These impacts include mercury contamination of water and wildlife (Bald Eagle and fish, acid precipitation, out-of-state surface mining (mountaintop removal), out-of-state underground mining and water use; the latter impact migrants that fly through and winter in New Jersey. Also, although some of these impacts are from generation outside of New Jersey, they need to be considered because New Jersey electric users create the demand for such generation and associated impacts. Because the proposed changes focus on birds and bats, the discussion of impacts from fossil fuel to wildlife needs to be expanded to include fish, herpetofauna, plants and other organisms. Wind and solar energy facilities, at least on shore, have not been demonstrated to impact these organisms. By providing a more complete description of the impacts of fossil fuel use by New Jersey electric users, a more balanced and credible approach to rule changes would be possible. The current summary ignores some of the more important impacts of fossil fuel based electric generation on birds, bats and other wildlife. (13, 18)

80. COMMENT: The rules take large areas of the State and make them off-limits to the

construction and operation of wind turbines. These same areas are identified as the best suited for wind development in the State. If the Department moves forward with these rules, will the State be able to achieve the goals of the global warming initiative? Will the State be able to meet the legislative goals and the goals that have come out of Governor Corzine's Office of 200 megawatts of onshore wind by 2021? (21)

81. COMMENT: The Department should repropose these rules because at a time when New Jersey is leading the nation in the development of solar energy, it is threatening to shut down wind energy development through these rules for reasons not justified by science. With respect to the rules as they pertain to wind development, the Department has put its thumb on the scale by looking almost exclusively at the kills of individuals caused by strikes. In looking at all the science, the threat to species is not wind turbines, it is climate change. However, the rules never consider climate change as a counterweight. (5)

82. COMMENT: The damages caused by global warming will likely change New Jersey to such an extent that the State may not be suitable for the same wildlife it is seeking to protect under these rules. The Department needs to provide an analysis of the harms caused by continued generation of electricity from fossil fuels versus the harms that are shown to be caused by renewable energy. Without this analysis, it is urged that the State err on the side of reducing the known environmental harms. Under the proposed rules it would appear that the Department is only counting potential deaths caused by impacts with towers. It is not counting the reduction in deaths caused by the reduced use of fossil fuels. It does not factor into the calculations the impact of a change in the shoreline and temperature caused by global warming and the reductions that will occur if renewable energy is adopted on a wide scale. A net impact would be more appropriate in order to generate a true decision on whether wind turbines create an unreasonable risk. (34)

83. COMMENT: Without much support, the Department seems to be predetermining that wind turbines create an unreasonable risk to the welfare of avian and bat life. A full analysis of the benefits as well as the potential harms to avian and bat life should be provided in the proposed rules. It would appear that the Department is merely looking at the harms without weighing the benefits of reduced fossil fuel usage. (34)

RESPONSE TO COMMENTS 78 THROUGH 83: The rules adopted herein are intended to help address the harms cause by the generation of electricity through fossil fuels. New Jersey's Energy Master Plan includes a number of challenges that the State must address, including New Jersey's contribution to global warming. The Energy Master Plan seeks to address this challenge in a number of ways, including by attaining a goal of the State meeting 30 percent of its electricity needs from renewable energy resources by 2020. Theses rules will assist the State in meeting the New Jersey Energy Master Plan's renewable energy goals by facilitating the review and construction of wind turbines and solar panels in appropriate locations. Further, if the Department did not adopt these rules, all wind energy facilities, regardless of their size, would require an individual coastal permit. While the Department believes renewable energy provides an important opportunity to produce electricity that does not contribute to greenhouse gas emissions, the Department believes that other environmental considerations must be taken into account in determining appropriate siting of these facilities. As further information is developed and becomes available, the Department will continue to adjust the rules to assure that renewable energy is encouraged to the maximum extent appropriate.

Birds and Bats

84. COMMENT: The proposed rules recognize that "wind turbines have the potential to impact breeding, wintering and migrating birds and bats, and when located in tidal waters, marine organisms." Such a finding is well recognized by and supported by a wide variety of governmental agencies involved in alternative energy development, as well as academic and nongovernmental organizations active on the issue. The

recognition that "emissions free is not impact free" is important to establishing a balanced policy for development of renewable energy facilities in the State's coastal zone, as well as essential in addressing the statutory compliance obligations incumbent on the Department.

The rules recognize and are built around "preservation…[of] the most ecologically sensitive and fragile area[s]": through limitations on siting in special areas identified under the Coastal Zone Management rules and Flood Hazard Area rules; and, through the Large Scale Wind Turbine Siting Map which is based upon Landscape Project data and extensive additional assessment of avian and bat habitat and life history requirements. (10)

RESPONSE: The Department acknowledges this comment in support of the rules.

85. COMMENT: The proposal summary states that "wind turbines have the potential to impact breeding, wintering and migrating birds and bats." While this statement is correct, it implies that impacts to birds are significant or have had an undue adverse impact on them. In addition, this statement ignores the significance of those impacts, which is critical for the permitting of projects in New Jersey and elsewhere. At no modern utility scale wind turbine installation in the United States has impact to birds been considered biologically significant. That is, it has not been demonstrated that impacts from wind turbines result in declines of populations of bird species. Nowhere in the proposed rules or technical manual does the Department discuss the issue of significance or mention that impacts have not been significant at wind farms in the United States. This omission of fact is critical because impacts may occur without being biologically significant. Biological significance is usually a primary criterion in the permitting process. Most projects will have impacts, but permits are decided upon based on whether those impacts are significant. To insure readers are fully informed, the document should state that there have been no significant impacts to birds in the United States at wind power facilities, with the possible exception of one wind power project in

California where there are 5,400 older wind turbines operating within a relatively small area. (13)

RESPONSE: The Department has reviewed the results of impacts on wildlife by wind turbines at other locations and does not feel that they offer enough data specific to this region to allow the Department to say with confidence that there will be no biologically significant impacts to wildlife, particularly endangered and threatened species that already have depressed populations. While the Department agrees that the impact of one turbine, particularly a small turbine, is not likely to have biologically significant impacts to populations in most cases, it is quite mindful of the potential cumulative impact of the turbines in the region as a whole and these must be explored and addressed. Moreover an individual turbine could have potential significant impacts to local wildlife. The importance of having sufficient information on potential impacts in a landscape type, taking into account the prevalence and habits of local and migratory bird populations, rather than relying upon results for dissimilar areas, is illustrated by the Altamont Pass wind farm where failure to take into account bird flight paths and behavior resulted in significant impacts and avian deaths. The limited monitoring to date indicates higher mortality along the coast than for turbines inland, in fact more than five times greater than at other landscape types.

86. COMMENT: To date, the Department has not considered small numbers of fatalities of birds and bats from other structures to be significant. No pre- and post- construction studies such as those outlined for Tier 4 turbines in the technical manual have been required by the Department for various types of projects that impact much larger numbers of birds. These include office buildings, communication towers, hotels and roads. The rates of fatalities at these projects equal or exceed those that would be incurred by one or two turbine developments. In addition, the Department has not required pre- and post-construction wildlife impact studies at fossil fuel energy generation facilities that impact vast numbers of birds and other wildlife. By requiring expensive and time-consuming

wildlife studies, the Department would impose severe economic constraints on the development of small clean energy projects. (13)

87. COMMENT: Given that other man-made structures have harmed far more avian life, the Department should revise this rule so that it applies to all structures and not just wind turbines. The Department should revise the coastal general permit for the installation of telecommunication towers at N.J.A.C. 7:7-7.25 to prohibit these towers in the same areas identified on the Department's Large Scale Wind Turbine Siting Map. This would assist in reducing the unacceptable levels of bird and bat mortality in these sensitive areas. (34)

RESPONSE TO COMMENTS 86 AND 87: The Department acknowledges that other types of developments such as high-rise structures and communication towers impact birds and bats. A CAFRA permit is not required for telecommunication towers located more than 150 feet from the mean high water line or landward limit of a beach or dune. Similar to the coastal general permits for wind turbines, the coastal general permit at N.J.A.C. 7:7-7.25 for the construction of telecommunication towers requires that the tower not be located in or on wetlands, beaches, dunes or wild and scenic river corridors, and requires compliance with the endangered and threatened wildlife or vegetation species habitat and critical wildlife habitat rules, N.J.A.C. 7:7E-3.38 and 3.39 respectively. For those projects requiring individual permits, these rules would also be addressed where applicable. The fact that these other types of development can impact bird populations highlights the importance of being aware and controlling impacts since many of the species populations are already under so much pressure due to other anthropogenic factors, reflecting the need to proceed cautiously in the face of limited information about the potential impacts of wind turbines in New Jersey's coastal area.

88. COMMENT: Wind turbine developers must consult with the United States Fish and Wildlife Service pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) ensuring the protection of Federally listed endangered and threatened species. If a

wind facility may affect a Federally listed species and, a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to Section 10(a)(1)(B) of the Act may be obtained by the developer upon completion of a satisfactory Habitat Conservation Plan for the listed species. There are no provisions for authorizing incidental take "after-the-fact." (35)

RESPONSE: The Department acknowledges the need for an incidental take permit in the above cited instances.

89. COMMENT: The United States Fish and Wildlife Service wishes to collaborate and partner with the State of New Jersey and seeks to foster constructive working relationships with individuals and industries to proactively seek ways to avoid or minimize adverse impacts on migratory birds. It is recommended that the Department include the United States Fish and Wildlife Service in the review of onshore wind projects for the protection of migratory birds. (35)

RESPONSE: The Department intends to coordinate with the United States Fish and Wildlife Service to ensure that the construction of wind turbines minimizes impacts to migratory birds.

90. COMMENT: Migratory birds are a Federal trust responsibility and are afforded protection pursuant to the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712). The United States Fish and Wildlife Service considers migratory bird concentration areas as environmentally significant. Atlantic coastal waters within several miles of shore are considered part of the migratory bird corridor. New Jersey's latitude, geography, and habitat suitability make it a critical stopover area for bird migration. New Jersey supports the second largest concentration of migratory birds in North America.

Unlike the Endangered Species Act, the Migratory Bird Treaty Act of 1918 has no provisions for allowing unauthorized take. However, the United States Fish and Wildlife

Service realizes that some avian fatalities may occur even if all reasonable measures are implemented to avoid or minimize project impacts. (35)

RESPONSE: The Department's Division of Fish and Wildlife mapped land of documented bird concentration and stopover locations for migratory songbirds, migratory raptors and migratory shorebirds. Regional areas where high migratory bird concentrations are well documented (for example, the lower Cape May peninsula and the Delaware Bayshore) were also identified on the map. Along the Atlantic coast corridor the rate of migrant bird passage is less well studied and only known concentration areas were included in the map. The species considered when delineating these regions were those documented to be at risk of colliding with wind turbines and/or those that exhibit flight patterns or behaviors that put them at collision risk.

The Coastal general permit for the construction of one to three wind turbines less than 200 feet in height and having a cumulative rotor swept area no greater than 4,000 square feet and Coastal general permit for construction of wind turbines less than 250 feet in height and having a cumulative rotor swept area no greater than 20,000 square feet at N.J.A.C. 7:7-7.30 and 7.31 respectively, and Coastal Zone Management rule amendments adopted at this time, contain a provision which allows the Department to require curtailment of wind turbine operations under certain conditions which could pose a high bird or bat mortality event. This provision is intended to reduce the impacts of the operation of wind turbines on birds and bats during peak migration periods. Curtailment will be required on specific wind turbine developments based on evolving scientific literature and monitoring results from in the State and elsewhere. In addition, as stated in response to comment 89, the Department will work with the United States Fish and Wildlife Service to further minimize the impacts of wind turbines on birds and bats.

91. COMMENT: Bat species are commonly observed migrating through the Atlantic Flyway. Following high bat mortality at wind farms in Minnesota, Tennessee, West Virginia and Wyoming, the United States Fish and Wildlife Service, Bat Conservation International, the American Wind Energy Association and the Department of Energy's

Natural Renewable Energy Laboratory formed the Bats and Wind Energy Cooperative to learn why these collisions occur and how they can be prevented. The Cooperative's priorities include: conducting daily carcass searches, understanding how bats interact with turbines, and assessing different methods and tools for understanding bat-turbine interactions and fatalities (Arnett, 2005). In West Virginia, a total of 456 bat carcasses were found during a 6-week study (Kearns, 2005). Overall, the species most at risk have been the hoary bat, eastern red bat, silver bat and eastern pipistrelle (Johnson, 2005) all of which occur in New Jersey. The United States Fish and Wildlife Service recommends that the Department include them in the review of onshore wind projects for the protection of migratory bat species. (35)

RESPONSE: Although there is not extensive data on migrating bats in the coastal region of New Jersey, several species have been known to roost on buildings and other structures during the fall migration and the recent offshore baseline study detected them over the ocean. A wide range of factors influencing the potential impact of wind turbines on birds has similarly been found to apply to bats. Bats also appear to engage in more exploratory behaviors with wind turbines than birds. In addition to the risk of collision, recent research has suggested that the bigger issue bats face regarding turbines may be barotraumas where tissue damage to their air-containing structures leads to death. Therefore, the Department has included bat protections in the rule and has required monitoring for all species of bats, including the three identified by the commenter, depending on the size of turbines and scale of the project and expects applicants to address these issues in their application submittals. The Department publishes notice of applications on its website and would welcome any input from the United State Fish and Wildlife Service on these projects.

92. COMMENT: Increased reliance on renewable energy sources, such as wind and solar, will reduce the amount of fossil fuels that are required to generate electricity. The reduction of fossil fuel usage for electricity will lead to the reduction of mercury emissions. A reduction in mercury emissions will have a positive effect on human health

as well as the health of wildlife by reducing the amount of mercury that bioaccumulates in wildlife. As such, an increase in renewable energy will have a benefit of reducing mercury in the environment. (34)

RESPONSE: The Department acknowledges that renewable energy is a clean energy source. The rules adopted herein are intended to promote the development of renewable energy in appropriate locations.

93. COMMENT: The rules take a narrow look at the physical impact of wind turbines on wildlife when considering the science. The rules also assume that the mere presence of a species leads to unacceptable levels of mortality. This assumption is made without defining the unacceptable level of mortality. For example, when assessing the threats to Red Knot, one of the species of greatest concern in the Delaware Bayshore area, physical strikes of any kind were never identified as a threat. Rather, the loss of habitat and impacts to its Arctic breeding grounds are identified as a threat to this species. Further, the Department is taking relatively unsubstantiated assumptions concerning impacts to wildlife and disregarding the real threats to species of concern identified in the rules and technical manual. The Department is fooling itself if it believes that so severely restricting wind development in New Jersey will protect certain species. (5)

94. COMMENT: The rules should not limit wind or solar energy unless the science is very clear that such an installation will have unacceptable environmental impacts. (12)

RESPONSE TO COMMENTS 93 AND 94: The Department mapped areas on land of documented bird concentration and nesting for resident and endangered bird species, as well as areas of documented bird concentration and stopover locations for migratory songbirds, migratory raptors and migratory shorebirds. Regional areas where high migratory bird concentrations are well documented (for example, the lower Cape May peninsula and the Delaware Bayshore) were also identified on the map. Along the Atlantic coast corridor the rate of migrant bird passage is less well-studied and only

known concentration areas were included. The species considered when delineating these areas were those documented to be at risk of colliding with wind turbines and/or those that exhibit flight patterns or behaviors that put them at collision risk. In fact, preliminary monitoring information, received by the Department subsequent to proposal of the new rules and amendments adopted at this time, for the Atlantic County Utilities Authority wind turbine facility in Atlantic City demonstrates the importance of fully analyzing risk. This monitoring data indicates that bird and bat mortality at this operating site is much higher than the national average.

95. COMMENT: The proposal summary acknowledges that there is not extensive data on migrating bats in the coastal region of New Jersey. As a result, the rule contains standards for unknown impacts to bats. (27)

RESPONSE: Since the proposal was published, the Department has received post-construction data for the Atlantic County Utilities Authority wind facility in Atlantic City. This data indicates that bats are affected by the turbines. The mortality for bats at this coastal location is greater than for birds and considerably higher than at any other landscape types, except mesa/desert.

Tiered approach to regulation of wind turbines

96. COMMENT: The Department's tiered approach to the regulation of wind energy facilities is an excellent way to provide an outline of how and what will be necessary in order to develop wind facilities in New Jersey to comply with the Energy Master Plan. It is critical to have easily understandable regulations so that potential applicants for wind energy facilities know in advance what will be expected of them and what the approximate timetable for their project will be. (14)

97. COMMENT: The rules will facilitate the development of renewable energy by establishing minimal levels of regulatory review for small scale/low risk projects, as

opposed to maintaining current regulatory requirements that all energy facilities be reviewed under the individual permit process. The Department's tiered approach with wind turbine development having the lowest potential impacts qualifying for authorization under a permit-by-rule and the level of Department review increasing as the potential impacts caused by the location, height or construction method of the wind turbine increases is supported.

Further, the proposed rules appropriately treat wind turbines differently, depending on location, height, rotor swept area, and design. The rule "provides adequate environmental safeguards for …construction" through the use of coast wide siting policies, setbacks and limitations on degree of site alteration in differing areas based upon environmental sensitivity and operational controls, design standards, and seasonal variability in controls. (10)

RESPONSE TO COMMENTS 96 AND 97: The Department acknowledges these comments in support of the rules.

98. COMMENT: The tiered structure of the permits-by-rule and general permits should be revised. The first tier of wind turbines includes total system heights up to 200 feet with a rotor swept area of up to 2,000 square feet. The second tier includes system heights up to 200 feet in height and a cumulative rotor swept area of 4,000 square feet. These tiers should be combined as the increase in rotor swept area is nominal. (11)

RESPONSE: The Department disagrees that these tiers should be combined. The Department believes that it is very unlikely that small scale wind turbines that meet the standards of the permit-by-rule, including the rotor swept area no greater than 2,000 square feet, will pose a significant risk to birds and bats. Therefore, the Department has determined that such turbines should proceed without Department review, provided the other parameters of the permit-by-rule are met. The Department does not agree that doubling the area swept by the rotor of a wind turbine is a nominal increase. The Department is concerned that turbines with rotor swept area increased from 2000 square

feet to 4000 square feet may pose a greater risk to birds and bats. Therefore, it is requiring a general permit application for such turbines, to allow it to review the specific location where such a turbine is proposed. In addition, the Department is requiring post-construction carcass surveys for the first 15 such turbines constructed, to evaluate whether these turbines are causing unanticipated levels of direct mortality to birds and bats. As further information and monitoring results become available, the Department will determine if any further amendments to the rules, including potentially expanding the permit-by-rule and general permit are appropriate.

99. COMMENT: Tier 1 wind turbines, those turbines subject to the proposed permit-by-rule, are wind turbines up to 200 feet in height, having a cumulative rotor swept area of 2,000 square feet or less, and any tower over 100 feet in height must be a monopole. These requirements essentially eliminate a number of manufacturers because their rotor swept areas exceed 2,000 square feet and the cost of a monopole is significantly more. Tier 2 wind turbines are essentially the same as Tier 1 except that the rotor swept area has been increased to 4,000 square feet. Tier 2 wind turbines do not qualify for a permit-by-rule, but instead require a coastal general permit. The whole purpose of the lowest tier was to streamline the permitting process through permitting by rule. By requiring a general permit for Tier 2 wind turbines, the Department is not streamlining the review process. (14)

RESPONSE: The height and rotor swept area of wind turbines subject to the permit-by-rule were not intended to eliminate manufacturers, rather they were intended to allow wind turbines of a certain size with minimal impacts to be constructed without the need for a permit from the Department. The Department considers a general permit a streamlined application and review process as the application requirements, application fee, public notification requirements and review timeframe to decision are greatly reduced from those of an individual permit application.

100. COMMENT: Tier 3 wind turbines are those up to 250 feet in height having a cumulative rotor swept area of no more than 20,000 square feet. While the height of turbines in this tier has increased by 50 feet (Tier 2 wind turbines are limited to less than 200 feet in height) the rotor swept area has increased by 16,000 square feet, a nearly 500 percent increase. Tier 3 should include wind turbines up to 300 feet in height and Tier 4 wind turbines should include those more than 300 feet in height since these types of facilities will be utility grade systems. (14)

RESPONSE: The relationship between the rotor swept area and turbine height is not linear. Based on the increased risk to birds and bats of turbines over 250 feet in height and information from New Jersey's Clean Energy Program and consultation with representatives of the wind industry, the Department determined that it is appropriate to limit the height and rotor swept area for Tier 3 turbines to 250 feet in height and those having a cumulative rotor swept area of no more than 20,000 square feet. The Department has determined that wind turbines greater than 250 feet in height have a significant potential to impact migrating song birds as they typically fly above 250 feet. Therefore turbines greater than 250 feet in height are subject to review under an individual permit application.

101. COMMENT: The United States and international wind turbine industries classify "small wind" turbines to be those up to and including 100 kilowatt. Wind turbines greater than 1 kilowatt to 1 megawatt are considered to be "medium" sized wind turbines and those over 1 megawatt are considered "large" scale utility grade turbines. The Department's tiered structure should mirror that which is already accepted throughout the world, rather than redefine the industry to their standards. Additionally, to classify 100 kilowatt units in the same category as large scale wind turbines is inappropriate and inaccurate. This will be detrimental to many small businesses, farms and municipalities in the State, as well as restrictive to the overall goals of New Jersey's Energy Master Plan. (11, 14)

RESPONSE: As an environmental protection agency, the Department has based the tiers on potential impacts to birds and bats rather than the wind industry's power rating classification system. The Department has examined available data for the 27 wind turbines built under the Clean Energy Program through March 2010. Of the 24 turbines for which the Department has data, all but the Atlantic City Utilities Authority utility scale project were less than 200 feet in height and have a rotor swept area of less than 2,000 square feet. This includes turbines at homes, farms and municipal buildings.

102. COMMENT: It is recommended that the top of the rotor swept area for Tier 1 wind turbines be less than 199 feet in height above ground level. In addition, there should be no lighting on the structure (Federal Aviation Administration requires lighting only for structures higher than 199 feet) and no guy wires. (35)

RESPONSE: The Department agrees that lighting should be limited on all turbine structures and guy wires used as little as possible. It is clear that these two elements can cause collisions and avoiding them is a prudent measure to reduce risk. The Federal Aviation Administration requires that any structure greater than 200 feet above ground level be marked and/or lighted (See 14 CFR Part 77). In addition, the Department has ascertained that the Federal Aviation Administration may require structures less than 200 feet in height to be marked and/or lighted if they exceed any obstruction standards in accordance with 14 CFR Part 77. The Department is amending the rule on adoption to provide for Federal Aviation Administration lighting for such obstructions.

103. COMMENT: It is recommended that Tier 2, 3 and 4 wind turbines be a monopole design instead of lattice design to prevent birds from perching and minimize other areas such as platforms and landing areas. It is also recommended that Tier 1 turbines not have guy wires. (35)

RESPONSE: The Department agrees that lattice towers and guy wires result in bird mortality. Therefore the rule proposal limited the height of lattice towers to 100 feet and

the overall height of the permit-by-rule and general permits to 200 feet or 250 feet. However, as described in response to comments 111 and 112, the Department is changing the rule on adoption to allow the use of lattice towers and guy wires to a height of 120 feet because it does not anticipate a significant effect on birds and bats at this height and it will accommodate most small scale wind turbines, thus achieving the goal of streamlining the permitting of these renewable energy developments.

104. COMMENT: It is recommended that mitigation be provided for direct and indirect impacts to avian species and bats. (35)

RESPONSE: Mitigation through curtailment of operations is one technique that minimizes impacts to birds and bats. Curtailment is a measure whereby the wind turbines are shut down when conditions are such that a high bird or bat mortality event is likely. With respect to the Atlantic County Utilities Authority site, the Department required the construction of osprey platforms as a form of mitigation to compensate for the impacts to that species. Curtailment or other mitigation measures can be applied to wind turbines other than those authorized under the permit by rule, as appropriate on a case by case basis.

Rotor Swept Area of wind turbines

105. COMMENT: The rotor swept area of a turbine may not be directly correlated with increased avian mortality and therefore may be unnecessarily limiting. The documents suggest that larger rotor swept areas cause an increase in avian mortality. Within the wind industry, a correlation between the rotor swept area and bird fatalities does not seem to be conclusive. For example, a Bergey 10 kilowatt wind turbine has a 23 foot rotor diameter, an 11.5 foot rotor length, and a rotor swept area of 415 square feet. A Jacobs 20 kilowatt wind turbine has a 31 foot rotor diameter, a 15.5 foot rotor length, and a 754 square foot rotor swept area. The difference in the rotor swept area is 45 percent or 330 square feet. Because the additional rotor length is added to the outside of the rotor swept

area, the "circle" of the rotor intersects more area and results in 45 percent more area swept by the rotor. However, the difference in the rotor length is only an additional four feet. While the rotor swept area of the Jacobs is considerably more, the actual increase in the size of the rotors and the interaction with the potential flight path of avian species is nominal. (11)

RESPONSE: Impact can occur at any point along the blade. Accordingly, while an increase in the blade length may not appear to be significant, as the commenter's example illustrates, the difference in the potential impact to birds and bats can be significant as the area in which birds and bats may be struck by a moving rotor increases exponentially.

106. COMMENT: The proposal summary states that wind turbines with a rotor swept area of 2,000 square feet or smaller are typically residential, small-scale facilities, whereas those between 2,000 and 4,000 square feet are more likely to be associated with municipal, industrial or commercial facilities. This statement overlooks and eliminates the Endurance/Energie PGE 35 kilowatt and 50 kilowatt units, both with a rotor swept area of 3,120 square feet. These wind turbines are of a size that will support small businesses, some larger homes, many smaller municipalities and many farms in the areas under consideration. The standard manufacturer's tower heights for these two units are 100 feet and 140 feet. Combined with their 31.5 foot rotor length, the total system height would not exceed 171.5 feet, well under the proposed 200 foot height cap.

Additionally, the Northwind 100, noted by the entire wind turbine industry as a "small wind" turbine, has a rotor swept area of 3,725 square feet and is also placed into a more onerous permitting category by having more than a 2,000 square foot rotor swept area. This size system will support very large homes, many mid-sized businesses and municipalities, as well as many farms. Some of the larger farms could use two or three of these units. With its standard tower heights of 98 feet and 121 feet and a rotor length of 34.5 feet, the overall system will not exceed 155.5 feet, considerably under the 200 foot height cap.

The proposal summary indicates that the 2,000 square foot maximum rotor swept area will accommodate most 50 kilowatt and smaller turbines. While this might be factually true, this requirement only allows one Entegrity 50 kilowatt unit having a rotor swept area of 1,920 square feet to be constructed under the general permit. The manufacturer of the Entegrity 50 kilowatt is currently having financial difficulties. This restriction eliminates the use of the other units noted above. As demonstrated above, there are few turbines with a rotor swept area of less than 2,000 square feet that would qualify for the coastal general permit and provide the needed energy for municipal, industrial or commercial facilities. This restriction may unintentionally limit the use of wind energy. (11)

RESPONSE: There is a general permit available for all the wind turbines cited by the commenter and there are wind turbine models produced by other manufacturers that would meet the size limits of the general permit. The Department created the tiered system to match the degree of review to the potential for impact from the proposed turbine. The 2,000 square foot rotor swept area limitation cited by the commenter is actually the limit applicable to qualification for the permit-by-rule which does not involve any application to the Department if all criteria outlined in the rules were met. While some of the products identified in the comment would not qualify for the permit-by-rule, based upon the information supplied by the commenter, these systems would all qualify for the reduced application requirements and review time under the general permit adopted at this time if all other criteria of the general permit were satisfied. The Department believes that this accommodation is appropriate for wind turbines with between 2,000 and 4,000 square foot rotor swept area and will not limit the use of wind energy, but will encourage it. The Department did not base requirements on any particular manufacturer’s products, rather on potential adverse environmental impacts.

107. COMMENT: The 1.5 MW GE wind turbines installed in Atlantic City have a rotor swept area in excess of 50,000 square feet for each wind turbine, a total of 230,000 square feet over the maximum cap of the coastal general permits. The likelihood of any

commercial grade wind turbine installation being built in the areas where the best terrestrial wind resource in the State is located is fairly slim. These larger wind turbines and similar projects of single or multiple wind turbines in this size range represent an opportunity to make significant headway toward realizing the 200 megawatt goal of terrestrial sited wind electricity by the end of 2020, as noted in New Jersey's Energy Master Plan. Without these larger sized installations, that goal will not be realized. While the State is advocating and mandating alternative energy sources, the Department through these regulations will effectively eliminate the possibility that wind turbines larger than a residential sized unit will actually be installed where most effective. (11)

RESPONSE: The rules do not preclude the construction of commercial-grade wind turbines. Rather the adopted amendments set forth a tiered approach to regulation. Under the adopted amendments, commercial grade systems such as the Atlantic County Utilities Authority wind turbines would be subject to an individual coastal permit, as they were prior to these amendments.

108. COMMENT: The Department is proposing to calculate the rotor swept area for vertical axis turbines by multiplying the rotor radius by the rotor height by 3.14. For vertical axis facilities, πrh as proposed in the rule equals half the total surface area rather than cross-section. The rotor swept area for vertical axis turbines should be $2\pi rh$. While the rotor swept area is of value, the Department should account for the more important metric for vertical access turbines that is rotor swept volume. (20, 24)

RESPONSE: The surface area of a cylinder excluding the top and bottom is $2\pi rh$. The Department has determined that it is appropriate to use only one-half of this area (πrh) because the effect would be the same regardless of the direction from which the bird or bat was approaching the turbine. For the same reason the Department did not use the volume of a cylinder.

109. COMMENT: Justification is lacking for the permitting requirements based on rotor swept area and number of turbines. The Department suggests that the impact on avian species increases with the size of swept area, but there is no justification as to why the intervals were selected: permit-by-rule up to 2,000 square feet; coastal general permit between 4,000 and 20,000 square feet; and no permits allowed beyond 20,000. As presented, the intervals are arbitrary. (7)

RESPONSE: Wind turbines having a cumulative rotor swept area of greater than 20,000 square feet may be permitted, however, they are subject to review for an individual coastal permit. The rotor swept areas were selected taking into account the potential for impact, the specifications of small scale wind turbines that are available, as well as to relieve the regulatory burden for smaller wind turbines. For example, wind turbines typically used at single family homes and small businesses have a rotor swept area no greater than 2,000 square feet. This limitation allows the construction of these small-scale turbines at most single family home and small businesses while not posing a significant risk to birds and bats. Wind turbines having a rotor swept area of greater than 2,000 and less than 4,000 square feet are more likely to be constructed at municipal, industrial and commercial facilities. These larger turbines are more appropriately reviewed taking into consideration the increased information provide by a general permit application. With the exception of the utility scale project at the Atlantic County Utilities Authority site in Atlantic City, none of the 24 wind turbines constructed under the New Jersey Clean Energy Program for which the Department was able to collect information exceeds a rotor swept area of 2,000 square feet.

Lattice vs. Monopole towers for wind turbines

110. COMMENT: The permit-by-rule, general permits and amendments to the Coastal Zone Management rules require that any portion of the tower of the turbine more than 100 feet above the ground surface be a freestanding monopole. It is important to understand that towers are either freestanding lattice or monopole with guyed wires. It is

not possible to order the first 100 feet as a freestanding lattice structure and then add another 20 to 60 feet of monopole tower. Most freestanding lattice towers for wind turbines are a maximum of 140 to 160 feet in height. Most turbine towers above 160 feet in height are a monopole design. Therefore, the maximum height of a lattice tower should be changed from 100 to 160 feet to accommodate the currently engineered and available wind turbines.

Requiring monopole towers for any wind turbine over 100 feet in height will significantly increase the installation costs of smaller residential and commercial wind turbine projects and ultimately result in projects being abandoned due to higher cost of a monopole tower. Monopole towers are approximately 30 to 35 percent more expensive than free standing lattice towers and represent 40 to 60 percent of the entire project cost. Another pertinent fact is that not all manufacturers of smaller wind turbines offer monopole towers. This could stop projects entirely, resulting in fewer wind turbine installations and less renewable energy production in the State. (9, 11, 14)

RESPONSE: The Department notes that many manufacturers of wind turbines have standard heights of 80, 100 and 120 feet. Moreover, maintenance costs of monopoles may be greater than lattice towers. The Department understands that towers are not partially monopole and partially lattice. As described in response to comments 111 and 112 below, the Department is changing the rule on adoption to increase the acceptable lattice tower height to 120 feet. This would accommodate all lattice towers built in New Jersey under the Clean Energy Program for which the Department was able to collect information.

111. COMMENT: Why is the use of lattice and guyed wired towers not permitted over 100 feet in height? At the December 11, 2008 stakeholder meeting, one attendee commented that lattice towers attract various avian species which “could” be of concern. Other than this statement, no documented evidence was provided. There is no documented evidence that implies that lattice towers over 100 feet in height are a problem. Research on this topic is inconclusive. (14)

112. COMMENT: A recent study has determined that perching rates and tower types have not been shown to affect avian mortality rates. According to the proposal, the purpose of the monopole requirement for turbines more than 100 feet in height is because wind turbines constructed using lattice towers have higher bird mortality as the lattice work provides a perching area for birds which may then fly into the rotating blades and be killed. Why will a bird perching on a lattice tower under 100 feet in height be less subject to harm then one perched on a 160 foot tower?

The 100 foot requirement relates to raptors perching on towers. Why would a raptor want to perch on a tower greater than 100 feet in height? Although a higher perching area gives the raptor a better overall view of the area, wouldn't they want to perch at a height of 50 or 100 feet where they would be closer to their food source, while still having a broad view of the area? How many birds in our geographic area perch at 100 feet or higher? Where is the habitat in the coastal zone where this would occur?

Monopole towers, including all smaller monopole wind turbines, that are not accessible via an internal climbing ladder have external climbing steps attached to the outside of the tower which run the full length of the tower. What is to prevent a raptor from perching on a climbing step thereby subjecting them to the same surmised outcome? (9, 11)

RESPONSE TO COMMENTS 111 AND 112: The commenters did not specify the study they were referring to so the Department cannot respond to "the recent study" findings they cite. There is research that shows that taller turbines kill more birds (deLucas et al., Collision fatality of raptors in wind farms does not depend on raptor abundance, Journal of Applied Ecology 2008, 45:1695–1703). Raptors are certainly known to perch at heights of 100 feet or more. Their keen eyesight allows them to hunt from towering heights. The Peregrine Falcon, an endangered species that resides in the coastal region, is an example of a raptor that prefers perching from high vantage points, including Atlantic City casinos and regional bridges. There is nothing to prevent a raptor from perching on the steps of a monopole, but there is likely to be less available surface area for raptors to

perch on than on a lattice structure. It would also provide less opportunity for nesting raptors (such as Osprey) since there would likely not be enough space to build a nest on a step but there might be on a lattice structure.

Since proposing the rule amendments, the Department has reviewed the dimensions of wind turbines built in New Jersey through March 2010 under the Clean Energy Program. The Department found that most of the 10 and 20 kilowatt turbines use lattice towers 100 to 120 feet tall and only one tower used guy wires. In researching available towers on the internet, 100 and 120 feet were commonly available lattice tower heights. The Department does not anticipate that changing the height of lattice towers from 100 feet to 120 feet would result in a significant impact on birds and bats. Therefore, the Department is modifying the rule on adoption to increase the acceptable lattice tower height to 120 feet, while keeping the total height of the turbine the same. This height is expected to accommodate small wind turbines, as demonstrated by the fact that 23 of the 24 wind turbines constructed under New Jersey's Clean Energy Program for which the Department has data would meet the size requirements of the permit-by-rule.

113. COMMENT: Lattice towers and guy wires will not be allowed for wind turbines more than 100 feet tall. Will the same guidelines apply to guyed and/or lattice radio, television, Loran and communication towers? If not, why? Surely there is the same inherent danger from the lattice style tower and guy wires for those uses, some of which are 1,200 feet tall guyed lattice towers, as there is for a wind turbine tower over 100 feet tall. If the Department is placing restrictions on free standing lattice and guyed lattice towers for wind turbines, then the same restrictions should be placed on other uses. Wind turbines should not be penalized. (11)

RESPONSE: The Department does have concerns with respect to the impacts of tall structures including guyed lattice towers on birds and recognizes that such structures kill birds. Where a permit is required for the construction of a telecommunication tower, compliance with the endangered and threatened wildlife or vegetation species habitat and critical wildlife habitat rules, N.J.A.C. 7:7E-3.38 and 3.39 respectively must be

demonstrated. The Department would assess the impacts of the tower on birds and bats under these rules. In contrast, wind turbines are regulated and are a new use in New Jersey's coastal zone. The rules are intended to address the potential impacts of these structures on birds and bats. Although birds may fly into tall structures such as telecommunication towers or other guyed towers, even if they were to perch on the towers the towers do not pose the same type of concern that is present for a bird such as a perching raptor perching on a tower supporting a wind turbine who may fly into a rotating blade either upon leaving the perch or upon approaching the tower in order to perch. While it is true that lattice towers and guy wires on the other types of towers mentioned by the commenter may attract perching and may pose risks from collision, the characteristics of those towers as compared to towers associated with wind turbines entail entirely different risks to birds.

114. COMMENT: Limiting the size of the monopole to 100 feet with the tip of the blade not being more than 200 feet would severely hinder the ability to install any type of windmill that will generate a decent and worthwhile amount of electricity. This is arbitrary and limits the amount of electricity that could be generated. The height of the monopole should be up to 200 feet with a blade not being more than 350 feet in height. (44)

RESPONSE: The rule does not preclude construction of wind turbines greater than 200 feet in height, nor does it limit the size of a monopole to 100 feet. Instead it sets a tiered approach to the regulation of wind turbines based on height. Wind turbines greater than 250 feet in height are subject to an individual permit rather than a permit-by-rule or general permit. The 100 foot limit cited by the commenter pertains to the height of lattice towers. As discussed in response to comments 111 and 112, this height is being changed to 120 feet on adoption.

Curtailment of wind turbine operations

115. COMMENT: Curtailment should not be limited to migration but should be broadened to 360 hours within any given year to address bird and bat mortality as needed according to any relevant information obtained by the Department and mortality thresholds or standards of impact that have been developed by the Department. Such an expansion of the curtailment provision would encompass, for example, an impact to a key Black Skimmer colony during breeding season. (20)

RESPONSE: The Department has limited curtailment to the migration period because it represents the time at which birds and bats are most vulnerable to collisions. Where the Department determines that proximity to a known nesting colony or a known breeding area creates an unacceptable risk to birds, the Department would not issue a permit for a large scale turbine. Accordingly, curtailment would not be an issue.

116. COMMENT: Curtailment of wind turbine operation to prevent impacts to birds is problematic and has never been tested for birds at modern turbine facilities. The rule proposal does not specify the types of birds for which curtailment will occur nor does it specify the time of day the curtailments will occur. The Richardson report from 1998 that was cited by the Department provides no empirical support for curtailment and was written before post-construction studies at modern utility-scale wind turbines had been conducted. Reference to this document is speculation and inappropriate as the basis of a rule change. Since Richardson's report was published, there have been over 30 post-construction fatality studies conducted at wind facilities focusing on night migrants. Those studies involved approximately 25,000 individual turbine searches, which represent the largest body of data ever collected regarding the impacts of energy generating facilities. These studies revealed fatality rates of migrants at wind turbines to be between zero to seven birds per turbine per year. Further, the Texas pilot project cited in the proposal is not referenced in the proposal and there has been no problem regarding night migration bird fatalities reported from the Texas wind facility.

The real problem with curtailment is that the number of birds that are killed on a per turbine basis is so small that it is almost impossible to predict when curtailment is

needed. With single turbine projects that may kill at a maximum five to 10 birds per year, curtailment is not warranted because impacts will not be significant to begin with and because predicting when to curtail operations has never been shown to be practical. (13, 18)

RESPONSE: In the proposal, the Department cited two published studies documenting that curtailment through an increase to cut-in speed (an additional 2 to 3 meters per second) during migrations has been proven to be effective at reducing bat fatalities. Further, curtailment through a change in cut-in speeds has also been proven to be effective for reducing bird mortalities in conjunction with tools such as predictive variables (weather conditions such as heavy fog, etc.) or migration monitoring radar. As referenced in the proposal summary, a pilot project is underway in Texas experimenting with "real-time" temporary shutdowns of turbines using radar to track bird movement patterns during peak migration periods and combining it with weather data to automatically shut down turbines if collision risk appears imminent. Curtailment will be required for specific wind turbine developments based on evolving science, including literature and monitoring results in the State and elsewhere. If the Department had strong evidence that a particular site/turbine were causing mortality events that could be reduced by temporary shutdowns, the Department could address the situation through curtailment of the wind turbine operations similar to the current experiment that is taking place in Texas. Although the Department hopes that collisions will be low as is seen in many sites across the United States, data from the Atlantic County Utilities Authority wind turbines indicates that rates are higher in the coastal region. The Department needs to be able to respond quickly and a curtailment provision written into the permit is one way to accomplish this goal. Again, curtailment measures may never need to be instituted; they are simply a tool to address a problem should it arise.

117. COMMENT: As the Migratory Bird Treaty Act (40 Stat. 755; 16 U.S.C. 703-712) has no provisions for allowing unauthorized take of migratory birds, it is recommended that curtailment of wind turbine operations should not be limited to 360 hours per year

during peak periods of bird migration. Instead, curtailment should be assessed following review of pre and post construction data on a case-by-case basis. Curtailment should also apply to periods of inclement weather, which may vary within a year and from year to year. The 360 hours of curtailment during peak periods of bird migration should only be implemented as an interim measure during review and analysis of pre and post construction data. Results of the pre and post construction period should then be applied to each wind facility for the life of the project. In the event that any project results in the death of migratory birds or bats, the specific permit should be conditioned upon undertaking an assessment of the contributing factors (e.g. weather, lighting, rotor speed, rotor or turbine color/markings, time of the year) to implement avoidance and minimization measures, as appropriate. (35)

118. COMMENT: The Department is proposing a maximum of 360 hours of curtailment per wind turbine per calendar year. Fifteen days per year to cover both the spring and fall migration periods is too short. The Department should require real-time radar with shut-downs tied to actual events. (24)

119. COMMENT: As currently written, the rule permits curtailment of operations to a total of 360 hours per year and only during the periods of April to June and August to November. It is recommended that the rule be amended to permit curtailment at any time during the year when populations of migratory or resident birds may be at risk due to operating turbines. In addition, as additional data is gained through post-construction monitoring and new literature, the Department should revisit the 360 hour per year limitation on curtailment of wind facility operations and revise the limitation if new data reveals a need for such action to protect avifauna. (47)

120. COMMENT: Three hundred and sixty hours of curtailment seems high and about half that value seems adequate based on the incidence of low wind conditions during migration season. Any larger number of curtailment hours could make an offshore wind

demonstration project uneconomical. Application of curtailment orders should be based on clear science and demonstrated problems at the site, not just theory. (6)

RESPONSE TO COMMENTS 117 THROUGH 120: Curtailment of wind turbine operations is intended to reduce the impacts of the operation of wind turbines on birds and bats during peak migration periods. The rule provides that curtailment shall not exceed 360 hours in a calendar year per turbine within the normal range of operation of the turbine. The normal range of operation refers to those wind speeds and conditions during which the turbines would typically operate. Curtailment will be required for specific wind turbine developments based on evolving science, including scientific literature and monitoring results in the State and elsewhere.

The Department believes that 360 hours of turbine curtailment during a year is conservative given that coastal New Jersey lies along the Atlantic Flyway, which is a major migration corridor for many species. The diversity of species using this corridor results in migrating species moving through New Jersey's airspace for as many as nine months of the year (http://www.njaudubon.org/Research/records.html). However, the Department also recognizes the economics of operating wind turbine facilities and that the shutting down of facilities must be somewhat predictable and cannot be unlimited. In developing the rule proposal, the Department attempted to strike a balance between the desire to promote renewable energy facilities in the coastal zone in New Jersey to meet the Energy Master Plan goals and the need to protect natural resources in the coastal zone, particularly those that would be impacted by the operation of wind turbines, notably birds and bats.

As noted in the summary, a pilot project is currently underway in Texas experimenting with "real-time" temporary shutdowns of turbines. Radar units at the site track the movement patterns of birds during peak migration periods from up to four miles away. This information is combined with weather data to automatically shut down the turbines if collision risk appears to be imminent. If the pilot study proves that this technique is successful in reducing collisions it could also be applied in New Jersey.

The Department's curtailment provisions do not preclude the United States Fish and Wildlife Service from requiring additional curtailment under the Migratory Bird Treaty Act.

121. COMMENT: The United States Fish and Wildlife Service estimates that between five and 50 million birds collide in the United States each year with tower structures or guy wires during night migration after being attracted by Federal Aviation Administration required warning lights. Most incidents occur in poor weather conditions with low clouds during the spring or fall. At least 231 species have been affected, with Neotropical migrants making up a large portion of all species killed. More than 50 of the species recorded in tower kills are of conservation concern, and any additional mortality must be considered a potentially serious threat to these species. It is recommended that any coastal permit for the construction of wind turbines be conditioned with the requirement that operations be shut down in poor weather with low cloud cover during migration times. (35)

RESPONSE: The adopted coastal general permits and standards for wind energy facilities provide that the Department may require the curtailment of wind turbine operations under certain conditions which could pose a high bird or bat mortality event. Weather conditions may necessitate curtailment of operations. Such conditions include low wind speeds, low altitude cloud cover, strong storms or approaching weather fronts favorable to bird and bat migration. This provision is intended to reduce the impacts of the operation of wind turbines on birds and bats during peak migration periods. However, the Department does not believe it is appropriate to automatically shut down all turbines in all locations in low altitude cloud cover at this time. The Department intends to use monitoring results and other scientific studies and information to make this determination.

122. COMMENT: The rules permit the Department to condition permits for certain turbines to require the curtailment of operations of the turbines during periods of peak

migration. The Department is commended for including this provision in the rules, which is critical to the protection of bird and bat populations. (47)

RESPONSE: The Department acknowledges this comment in support of the rule.

Setback requirements for wind energy facilities

123. COMMENT: As proposed, N.J.A.C. 7:7-7.2(a)12, 7.30 and 7.31, and N.J.A.C. 7:13-7.2 allows for the construction of wind turbines if they are set back 50 feet from wetlands. However, a 50 foot setback is inconsistent with the Freshwater Wetlands Protection Act rules at N.J.A.C. 7:7A-2.5(b)), since wetland transition areas have varied widths of 0, 50 and 150 feet depending on the resource classification of the wetland. Consequently, if a wind turbine was sited under any of the permits-by-rule or general permits cited above, but adjacent to a freshwater wetland, the proposed 50 foot setback would either be too restrictive, as in the case of an ordinary wetland, or not restrictive enough as in the case of an exceptional resource value wetland. In the latter situation, a wind turbine project permitted under the proposed permits-by-rule or general permits would be in violation of the Freshwater Wetlands Protection Act rules. Therefore, the Freshwater Wetlands Protection Act rules should be amended to allow for a 50 foot setback for the construction of wind turbines adjacent to intermediate and exceptional resources value wetlands. (28)

RESPONSE: As with any permit granted under the Coastal Zone Management rules and Coastal Permit Program rules, obtaining the coastal permit for a wind turbine does not relieve the applicant from obtaining all other applicable permits and complying with any requirements applicable to such permits on both the State and local levels. The rule is not intended to replace the Freshwater Wetlands Protection Act rules, although where the freshwater wetlands are of intermediate resource value, the freshwater wetlands buffer and the buffer under the general permits and permit-by-rule will be the same.

124. COMMENT: While it is important to have setbacks for wind and solar energy facilities from streams and wetlands, the same setbacks should be enforced for all types of development. While the protections of natural and scenic resources from the potential impacts of renewable energy is supported, the same standards should apply to power lines, highway widenings, glass buildings, and cell towers. The proposed rules create a double standard for renewable energy installations. (44)

125. COMMENT: There should be no setback from tidal waters for residential, small farm and/or small commercial installations. The 50 foot setback requirement may also exceed the setback requirements for local zoning and permitting compliance. Further, along the Delaware Bay and elsewhere, the predominant direction of the wind resource is from the water. As one gets further away from the water, more friction, turbulence and obstructions are encountered, all of which decrease the production and viability of a wind turbine installation. (11)

RESPONSE TO COMMENTS 124 AND 125: The setbacks in the permits-by-rule and general permits are designed to streamline permit processing, and are similar to those applicable to general permits for other non-residential structures, such as recreational and marina facilities and telecommunication towers.

126. COMMENT: It is widely understood that the most suitable wind resources in New Jersey's coastal zone are located in the vicinity of tidal waters. It is reasonable and appropriate to impose a setback requirement to protect sensitive tidal waters from the impact of physical disturbance and allow for the maintenance of natural buffers along these waters. Because it is the ground disturbance that has the potential to adversely impact tidal waters, the setback requirement should only be applied to the portions of the turbine that cause ground disturbance (that is the foundation) and should not be applied to aerial features such as turbine blades.

The proposed rules require all wind turbines to be located at least 50 feet from tidal waters. While this does represent an improvement from the existing five hundred foot

setback for energy facilities, the proposed rule inappropriately and unnecessarily requires that the turbine blades meet the 50-foot setback. As a result of this requirement, larger wind turbines would have to be set back more than 150 feet from the tidal water.

The actual setback for a given turbine tower is determined by applying the horizontal offset from tidal waters together with the hub height and blade radius of the turbine. For a 1.5 megawatt GE XLE turbine with an 80 meter hub height and a 35 meter blade radius, the 50 foot setback requirement would result in an actual setback of the center point of the turbine monopole of approximately 168 feet. While the wind swept area associated with the turbine would extend over tidal waters, the closet approach of a turbine blade to tidal waters would be approximately 189 feet. These distances substantially exceed the setback requirements for exceptional resource value wetlands under the Freshwater Wetlands Protection Act.

Based on the above, the Department should amend the rules on adoption to strike the applicability of the setback to the turbine blades and limit the applicability to ground disturbance only. Alternatively, the Department should amend the proposed rules on adoption to require larger setbacks, perhaps 150 feet from highly sensitive tidal waters such as shellfish growing waters, moderate setbacks of 50 feet from moderately sensitive tidal waters that are neither highly nor minimally sensitive, and requiring no setback from minimally sensitive tidal waters including manmade features such as port facilities lagoons, canals and mosquito ditches. (13)

RESPONSE: The commenter's example is correct in that the monopole would be set back 168 feet from tidal waters. However, the blade would not be set back 189 feet from tidal waters, rather the tip of the blade would be 50 feet from the water and no portion of the rotor swept area would extend over tidal waters.

The Department has had a long-standing requirement at N.J.A.C. 7:7E-7.4(b) for any type of energy facility to be set back 500 feet from the water, unless the facility requires access to the water. This adoption reduces the setback to 50 feet for wind turbines and solar panels. The setback does take into account the sensitivity of different areas of the State, as it does not apply to tidal waters in the following Waterfront Development

regions: urban area, northern waterfront, Delaware River regions, described at N.J.A.C. 7:7E-5A.2(d). Further, in recognition that manmade lagoons are highly disturbed areas and construction adjacent to them does not pose the same risks to wildlife as construction adjacent to coastal waters, wetlands, beaches and dunes, the 50 foot setback requirement does not apply to wind turbines subject to the permit-by-rule at N.J.A.C. 7:7-7.2(a)12 and the coastal general permits at N.J.A.C. 7:7-7.30 and 7.31. Ditches are another manmade water feature. For the same reasons as manmade lagoons, the Department feels that a setback from ditches is unnecessary to address wildlife concerns, although where such features are within wetlands, setbacks to wetlands remain a condition of the permit-by-rule and general permits. Therefore, the Department is amending N.J.A.C. 7:7-7.2(a)12 and N.J.A.C. 7:7-7.30 and 7.31 to provide that the 50 foot setback does not apply to manmade ditches. Consistent with N.J.A.C. 7:7-7.2(a)12 and N.J.A.C. 7:7-7.30 and 7.31 and the above change, the Department is amending N.J.A.C. 7:7E-7.4(b)3 on adoption to provide that the 50 foot setback from tidal waters does not apply to manmade lagoons and manmade ditches.

Lighting on wind turbines

127. COMMENT: Although the proposal summary indicates what is meant by "shielded lighting" it is undefined in the rule text. Accordingly, the following language should be added to N.J.A.C. 7:7-7.2(a)12vi, N.J.A.C. 7:7-7.30(a)7, N.J.A.C. 7:7-7.31(a)8; N.J.A.C. 7:7E-7.4(r)1vii(2) and (r)1viii(1); and N.J.A.C. 7:13-7.2(b)19vi: "Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light." (28)

RESPONSE: As noted by the commenter, in the proposal summary the Department explained that shielded lighting is lighting that is covered in a way that light rays are not emitted above the horizontal plane of the light. See 41 N.J.R 3173. For the purposes of clarity, the Department is amending N.J.A.C. 7:7-7.2(a)12vi, N.J.A.C. 7:7-7.30(a)7,

N.J.A.C. 7:7-7.31(a)8; N.J.A.C. 7:7E-7.4(r)1vii(2) and (r)1viii(1); and N.J.A.C. 7:13-7.2(b)19vi to explain what is meant by the term "shielded lighting."

128. COMMENT: Wind turbines with a top of the rotor swept area greater than 199 feet above ground level will be required by the Federal Aviation Administration (FAA) to employ aircraft warning lights. It is recommended the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA that would not compromise aviation safety be used. White strobe lights should be used as opposed to red incandescent blinking lights. Lights with a longest possible off-cycle are less attractive to birds than lights with a shorter off-cycle. Solid red or pulsating incandescent red warning lights at night should be avoided. Red strobe lights require further investigation (Manville, 2000). According to Kerlinger and Hatch (2001), bright spotlights or mercury vapor lights are known to attract birds and should be used only on occasions where the safety of maintenance workers is a concern. (35)

RESPONSE: The Department agrees with the commenter that birds are affected by lighting on tall structures, particularly steady burning solid state lights. Research has shown that strobe lighting on tall structures appears to reduce the number of bird collisions when compared to similarly sized structures outfitted with steady burning lights. The Department's Division of Fish and Wildlife recommends strobe lighting be utilized for tall structures including wind turbines. Further, in order to prevent adverse impacts on birds while allowing for lighting at ground level if desired for security concerns, the rules require that no lighting be placed on or directed at the wind turbines other than shielded level security lighting and lighting required by the FAA or United States Coast Guard. The FAA provides standards on lighting required for wind turbines, including whether lights must be flashing or steady burning, the color of the lights, and synchronization of flashing lights. Because the FAA standards may apply to turbines less than 200 feet in height, this exception has been added to the permit-by-rule and general permit at N.J.A.C. 7:7-7.2(a)12 and 7.30, respectively. The March 2005 Aids to Navigation Manual — Administration provides guidelines for Offshore Renewable

Energy Installations, including offshore wind farms. These guidelines address how wind farms should be marked, such as painting and lighting. The guidelines call for the use of flashing yellow lights. Lighting at a specific installation would be ascertained with the Coast Guard's District Commander.

129. COMMENT: The proposal states that birds are affected by lighting on tall structures, particularly steady burning red solid state lights. Therefore the proposed amendments provide that no lighting be placed on or directed at the turbines other than shielded ground security lighting or lighting required by the United States Coast Guard or Federal Aviation Administration. Federal Aviation Administration lighting requirements vary depending on height: for structures less than 150 feet tall, obstruction lighting is required; for structures greater than 150 feet in height, flashing red lights are required; for structures over 250 feet tall two intense flashing white strobe lights are required. Based on the above lighting requirements, it is inappropriate to allow wind turbines greater than 250 feet in height due to excess visual pollution at night, that is, visual impact during night sky viewing such as in Dennis Township, Cape May County. Rather 200 feet should be considered the maximum height for wind turbines. In addition, the proposal summary notes that red lights that are required on all structures per Federal Aviation Administration requirements cause problems with birds. What about the intense white flashing strobe lights required for structures greater than 200 feet in height? (24)

RESPONSE: While Federal Aviation Administration lighting requirements vary based on height and location of the structure to be constructed, the Department does not believe it is appropriate to bar development of wind turbines based on lighting alone. Rather, a case-by-case review of a large scale project is the appropriate means to consider effects on wildlife. Wind turbine developers and other interested parties are encouraged to contact FAA at www.oeaaa.faa.gov for further information regarding necessary notice and lighting requirements. The Department has further investigated the FAA lighting requirements and determined that in some cases the FAA requires lighting on structures less than 200 feet in height. Although the general permit at N.J.A.C. 7:7-7.31 and the

Coastal Zone Management rules at N.J.A.C. 7:7E-7.4(r)vii(2) and viii(1) provide for lighting in accordance with FAA requirements, the permit-by-rule and general permit proposed at N.J.A.C. 7:7-7.2(a)12 and 7.30, respectively, did not. Accordingly, these sections of the rule are being change on adoption to reflect the FAA requirements. Because of the limited onshore wind resource, it is expected that only a small number of turbines are likely to be proposed, which would limit the lighting impact.

With respect to strobe lighting, research has shown that strobe lighting on tall structures appears to reduce the number of bird collisions when compared to similarly sized structures outfitted with steady burning lights. Therefore, it is recommended that turbines 200 feet in height or taller be lit with strobe lights to reduce the impact to birds.

Large Scale Wind Turbine Siting Map

130. COMMENT: The detailed rationales explaining how the Department identified areas unsuitable for wind turbine development contained within the Department's Large Scale Wind Turbine Siting Map Report is appreciated. The process by which these scientific decisions were made contributes to the overall success of the project. (20)

131. COMMENT: Adaptive management, especially in situations in which there are huge gaps in data and much scientific research remaining to be done related to the resources to be protected, as in the case of wind facility siting in New Jersey's coastal zone, is supported. The acknowledgements in the proposal which state that as more data becomes available and as the relevant scientific research provides better understanding of the impacts, changes in the rules may be adopted to better protect wildlife is supported. In particular, the provisions at N.J.A.C. 7:7E-7.4(r)3 describing the process by which the Large Scale Wind Turbine Siting Map may be revised based on new information from a variety of sources is supported. (47)

132. COMMENT: The Department's Division of Fish and Wildlife has mapped areas on land of documented bird concentration and nesting for resident threatened and

endangered bird species, as well as areas of documented bird concentration and stopover locations for migratory songbirds, migratory raptors, and migratory shorebirds. This map includes the Delaware Bayshore and all coastal wetlands (and all land within one kilometer of these wetlands) beginning at the lower 20-kilometer boundary line and extending around the Delaware Bayshore to the northern site of the Cohansey River. In these mapped areas, the installation of wind turbines 200 feet in height or taller or having a cumulative rotor swept area greater than 4,000 square feet on a site is prohibited due to potential impacts on migratory and resident birds and bats. The Department is applauded for undertaking the difficult task of mapping areas significant to threatened and endangered species. (20)

133. COMMENT: The Large Scale Wind Turbine Siting Map provides predictability to potential wind developers, and, as such, enhances successful development of wind projects by providing clarity to the regulatory process. (10)

RESPONSE TO COMMENTS 130 THROUGH 133: The Department acknowledges these comments in support of the rule.

134. COMMENT: Should open waters become permissible for wind turbine development, the map and report must be revised to identify open waters that should be protected. (20)

RESPONSE: The map does not address open waters in the CAFRA and certain Waterfront Development areas because the rules to do not allow the construction of wind turbines in these waters at this time. However, should the rules change to allow construction of turbines in these open waters, the Department would consider revising the map to include water areas.

135. COMMENT: The Department is urged to develop a similar Large Scale Wind Turbine Siting Map for New Jersey's tidal waters and Federal waters that allows for

protection of aquatic resources while maximizing energy generation potential. This effort will first require identifying areas that support vulnerable species populations, contain unique habitats, are critical to other established ocean dependent uses, or have other important ecological attributes that need to be identified and protected. Development in the following types of areas/resources should be avoided: Habitat Areas of Particular Concern designated under the Magnuson-Stevens Fisheries Conservation and Management Act; endangered or threatened species or their habitat; areas of high biological productivity, diversity and/or abundance and areas that provide important life-cycle, feeding or migratory corridors (i.e., upwelling areas; important sea turtle, marine mammal and bird foraging areas; and dense fishery areas); important or sensitive types of seafloor habitats (i.e., topographic highs and submerged aquatic vegetation); and especially rare or functionally fragile marine resources. Some of these sensitive areas will need to be designated "off-limits" to development, while identified low impact areas may be more suitable for siting renewable energy facilities. Another issue that should be included in an offshore mapping and planning effort is the identification of frequently used shipping areas, keeping in mind that many vessels only utilize designated shipping lanes as they near harbor entrances. There are many mapping efforts currently underway that can be utilized by the Department. The National Oceanic and Atmospheric Administration, in partnership with the Minerals Management Service, has begun a coastal mapping effort, the Multipurpose Marine Cadastre, to support the marine spatial planning process and is developing a collaborative effort with states and affected and interested groups on a regional basis. The Nature Conservancy is also developing a Northwest Atlantic Marine Ecoeregional Assessment that will synthesize the available geological, oceanographic, biological and anthropogenic information for the area from the Bay of Fundy south to Cape Hatteras, North Carolina. Finally, once available, data from the Ecological Baseline Study should be layered together with all other relevant data and information to reveal the "ecological hot-spots." Proper site planning must also ensure facilities are located near critical land-based energy infrastructure by determining the on-shore transmission requirements of offshore wind facilities and identifying potential locations that can support these needs. New Jersey should utilize a

precautionary approach when developing a marine waters wind turbine siting map and allow for revisions as new information becomes available on habitat and species occurrence, distribution and abundance, as well as impacts and buffers. (50)

RESPONSE: The Department's Coastal Management Office developed the New Jersey Ocean Atlas which identifies telecommunication cables, State waters, artificial reefs, the Historic Area Remediation Site (HARS), dump sites, New Jersey Geologic Survey shoal sand resources and New Jersey Geological Survey sand resource study areas. The Ocean Atlas is designed to be a current, comprehensive source of information for spatial ocean resources data. In addition, the Ecological Baseline Study final report includes a sensitivity map identifying the relative sensitivity of areas of the ocean to potential impacts from energy facilities based on ecological impacts. The Department will work through the Minerals Management Service (since renamed and hereafter referred to as the Bureau of Ocean Energy Management, Regulation and Enforcement) New Jersey Wind Energy Task Force to address siting, construction and operation issues.

136. COMMENT: The Department is urged to adopt the important planning principles laid out in the Federal Clean Ocean Zone legislation, set to be introduced in the U.S. Congress by New Jersey Legislators. (50)

RESPONSE: The Department monitors legislation and rulemaking on the Federal level that is related to areas the Department regulates and, if the legislation becomes law, will make amendments determined to be appropriate to assure coordination between the Federal and State programs.

137. COMMENT: The lack of upland maritime forest protections in the Large Scale Wind Turbine Siting Map report along both the Atlantic and Delaware Bay coasts is objectionable. Given that coastal upland maritime forests in and around the Atlantic and Delaware Bayshore are quite significant for migrant land birds, it is suggested that these areas be included in the Department's Large Scale Wind Turbine Siting Map. Data

supports the proposition that maritime forests within one kilometer of tidal marsh should be considered a "no build zone" because these areas are heavily utilized by migrant land birds during the spring and fall migrations. (20)

RESPONSE: Much of the barrier islands and areas within one kilometer of shore are included in the mapped area. However, where endangered or threatened species data does not support inclusion, areas were not mapped. Therefore, not all upland maritime forests are included in the Large Scale Wind Turbine Siting Map. Wind turbines in such areas would still be subject to review under the Coastal Zone Management rules, including the Critical Wildlife Habitat rule, N.J.A.C. 7:7E-3.39. Under that rule, development is discouraged unless it would have only minimal interference with the habitat, has no alternative locations and includes mitigation.

138. COMMENT: The discussion of the American Black Duck at 41 N.J.R. 3175 implies that this species may be at risk of being impacted by wind turbines, although none have ever been reported killed at wind turbine facilities. The Department currently sanctions the legal shooting of approximately 12,000 American Black Ducks annually without significant impact and the approximate Atlantic Flyway harvest of American Black Ducks is approximately 95,000 per year. Further, it is imperative that the Department make it clear that the post-construction fatality reports from the Atlantic County Utilities Authority do not indicate that any ducks or geese have been killed during the two years of study. This strongly suggests that waterfowl are not at significant risk from wind turbines. (13)

139. COMMENT: "Wind turbines have the potential to impact breeding, wintering and migrating birds and bats…" This statement is correct, but does not mention the significance of those impacts. Not a single duck or goose has been killed to date at the Atlantic County Utilities Authority project site. This strongly suggests that waterfowl are not a significant risk from wind turbines. (18)

RESPONSE TO COMMENTS 138 AND 139: While no waterfowl have yet been discovered at the Atlantic County Utilities Authority site, that does not mean there is no potential for impacts from turbines. Research from other locations indicates that some waterfowl show avoidance behaviors around wind turbines, so the potential impact from collision is not the only impact siting of wind turbines could have on waterfowl. Site avoidance could affect nesting and foraging behaviors. In light of the limited information available at this time on the significance of collision and habitat impacts to waterfowl, the Department believes it is appropriate to gather additional information to more fully understand these impacts in the coastal region and their significance to guide future decision-making.

140. COMMENT: The Department concluded that nesting colonies with a small population size, such as the Black-crowned and Yellow-crowned night Heron colonies in which 10 or fewer individuals were observed were not critical to the survival of the species in the State. The report however, provides no evidence supporting the reasonableness of this conclusion. The data necessary for verification includes histograms showing colony size in relation to number, the percentage of the State population found within these colonies and the total number of colonies excluded. (20)

RESPONSE: The Department reviewed the data that was available for all these species and came to the conclusion that the selected parameters were the most reasonable to balance the needs of the species with the desire to develop wind energy in the coastal region. The Department set these limits so that areas of the State would not immediately be restricted for large wind installations if they were not as important to the population. For example, a site that housed a colony of Yellow-crowned Night-herons where 4 individuals were recorded one time in the mid-1980s is not as critical to the populations as a site that has hundreds of night-herons and has been active for decades. The Department did not find any literature that would guide it in setting these limits, so instead it conducted a review of all the data and chose parameters based on staff expertise. The Department mapped large colonies that have persisted for many years,

smaller colonies that have persisted for multiple years and larger colonies in habitat that is still suitable where the colonies may not have persisted as long, but were vital to the population for the years they were active. The Department eliminated from the map the smallest colonies that did not persist for long periods. If these sites gain importance over time, the map can be updated or a permit can be rejected based on the most recent information. In setting these parameters, the Department was seeking to limit the sites that would automatically be off-limits for large wind installations to only the sites where it was truly deemed necessary, allowing for a case-by-case review of other sites through the individual permit process.

141. COMMENT: The Department asserts that the Sea Girt National Guard Training Center (NGTC) beach is critical to sustaining the State populations of Least Terns. For the reasons set forth below, the NGTC beach is not critical to sustaining the State populations of Least Terns. Therefore, the NGTC beach should be deleted from the Department's Large Scale Wind Turbine Siting Map.

The habitat favored by the NGTC's least tern colony was created artificially and is currently not present. The 1997 United States Army Corps of Engineers beach nourishment project played a large role in successful Least Tern fledging at the NGTC beach. The nourishment activities deposited a substantial amount of sand on the beach in both elevation and width. Being a ground nesting bird, least tern nests are susceptible to flooding from routine high tide or storm events. In the early 2000's, a protection area known as the Northern Protection Area was established by the Department, National Guard Training Center, and the United States Fish and Wildlife Service to protect least terns, piping plovers and sea beach amaranth. Prior to the 1997 beach nourishment, the NGTC beach was too narrow to support the Northern Protection Area and most likely experienced frequent overwashes from high tides and storm events. Post nourishment, the beach nearly doubled in width, fostering least tern nesting habitat. Currently, subsequent erosion from several severe storms since 2000 has further eroded the beach, reducing acceptable least tern nesting habitat and subjecting the ocean side of the Northern Protection Area to daily over wash from high tides. Absent long term

nourishment activities from the United States Army Corps of Engineers, it is unlikely that conditions favorable to tern nesting will return as was seen after the beach nourishment activities.

The NGTC beach has fledged only a handful of least terns and was limited to a few years in the early 2000's. Nesting data (1976 to 2009) from the Department, United States Fish and Wildlife Service and the National Guard Training Center's biologist, indicates least terns have only nested on the NGTC beach from 2000 to 2003 and 2005 (Parsons 2005 and Pover 2009). A total of 15, 197, 48, 26 and 2 adults yielded 15, 14, 9, 0 and 0 chicks from 2000, 2001, 2002, 2003 and 2005 respectively. Since 2005, no terns have attempted to nest at the NGTC beach nor has the facility had a successful fledge since 2003. The NGTC beach pales in comparison to the least tern colonies at Sea Bright, Monmouth Beach and Sea Girt's Wreck Pond which average 81, 312 and 67 adults annually (1996 to 2008). These colonies also have successful fledges each year (Pover 2009). Labeling those colonies as critical to sustaining the State population is justified. However, placing the NGTC beach which briefly flourished after a beach nourishment project and is currently unproductive in the same category is not justified.

Due to substantial vegetation growth, the NGTC beach is slowly becoming less favorable as least tern habitat. Least terns nest on bare sandy areas, sandy dredge disposal sites, or areas sparsely vegetated with typical beach vegetation such as sea rocket, American beach grass, beach clotbur and seaside spurge that are just beyond the reach of normal spring tides. Piping plovers and least terns favor similar nesting sites and plover typically nests in areas with vegetative cover between five percent and 15 percent. According to the Summary Report for the 2008 Rare Species Monitoring Services for the NGTC, American dune grass coverage (50 to 80 percent) and density (25 to 169 structures per square meters) is typically high in most of the Northern Protection Area (Amy Greene 2009). The beach nourishment in 1997 covered much of the existing beach vegetation leaving a sparsely vegetated substrate suitable for a tern colony. Currently, there are portions of the NGTC beach that may meet these criteria, but those areas are heavily used by the bathing public during the nesting season negating the establishment of a permanent tern colony. In addition, the Northern Protected Area has slowly

increased in vegetative cover. Once the Northern Protected Area was established, beach maintenance activities such as beach raking, were suspended in the Northern Protection Area, allowing vegetation to slowly reestablish itself. It appears likely that future study will demonstrate that the beach grass population is expanding and becoming denser within much of the Northern Protection Area, thus further reducing the NGTC beach habitat potential for least terns. (37)

RESPONSE: Beach nourishment projects are designed as 50-year projects with a renourishment schedule built into the project. Therefore, while the beach may currently be smaller in size than the beach in 1997 after the nourishment was completed, the beach is expected to be renourished according to the approved renourishment schedule resulting in a larger beach habitat for least terns. In addition, sites north of the National Guard Training Center are also filled and those sediments often drift down shore and allow areas downdrift to accrete. Therefore, one cannot state that the area is not likely to serve as habitat in the future. It likely will serve as habitat based on the site history. Least terns feed exclusively on fish and must commute from their beach nesting colonies in search of food. As mentioned, they nest at nearby Wreck Pond in Sea Girt and also at Monmouth Beach and Sea Bright. The Department has data and has observed least terns foraging at Stockton Lake even in years when there was no active nesting at the site. Other research has shown that terns are susceptible to collisions when turbines are located in between nesting colonies and foraging locations, which is why some portions of the National Guard Training Center are designated as restricted areas for large turbine installations.

142. COMMENT: The Department's Large Scale Wind Turbine Siting Map includes areas outside of the CAFRA area. Will the map apply to wind turbine developments in the CAFRA area only or will it apply to areas outside the CAFRA area? It is recommended that the Map apply to the CAFRA area only. (37)

RESPONSE: New Jersey's coastal zone includes the CAFRA area; any tidal waters of the State and all lands lying thereunder; all lands outside of the CAFRA area extending

from the mean high water line of a tidal water body to the first paved public road, railroad or surveyable property line existing on September 26, 1980 generally parallel to the waterway, provided that the landward boundary of the upland area shall be no less than 100 feet and no more than 500 feet from the mean high water line; all areas containing coastal wetlands; and the Hackensack Meadowlands District. The coastal permits-by-rule and general permits and standards for construction of wind energy facilities on land and in water apply to both the CAFRA area and the Waterfront Development area. Therefore, in developing the map, the Department carefully evaluated all land areas within New Jersey's coastal zone and identified areas in the coastal zone where wind turbines 200 feet in height or taller or having a cumulative rotor swept area of greater than 4,000 square feet are unacceptable due to the operational impacts of the turbines on birds and bats.

143. COMMENT: The waterfront development area outside of CAFRA extends from the mean high water line of tidal water bodies to the first paved public road, railroad or surveyable property line. At a minimum, the zone extends at least 100 feet but no more than 500 feet inland from the tidal water body. Where is the Geographic Information System data that presents the locations of New Jersey's tidally flowed water bodies? (37)

RESPONSE: Geographic Information System data can be downloaded from the Department's GIS website. The Head of Tide data can be used in conjunction with the hydrography layers to estimate the extent of tidally flowed water bodies. See http://www.nj.gov/dep/gis/stateshp.html#HOT.

144. COMMENT: According to the Board of Public Utilities' New Jersey Wind Resource Explorer, the best onshore wind resources in New Jersey are located in its coastal areas, most of which is within the CAFRA zone. The Department should develop a map that presents the acceptable wind turbine development following the Department's tiers. The map should use the 2002 land use land cover data, the Department's Large Scale Wind Turbine Siting Map, potential wind resources, and other engineering

considerations such as building setbacks for ice throw, noise, and flicker effects. Such a map will show that wind development in New Jersey will be limited to small scale wind turbines scattered throughout the CAFRA zone. A plethora of small scale wind development may cause more impacts to birds and bats than several large scale developments. In addition, this haphazard approach most likely will not produce the 200 megawatts of renewable energy derived from onshore wind development required in the 2008 New Jersey Energy Master Plan. (37)

RESPONSE: The Department's approach to creating the Large Scale Wind Turbine Siting Map was to provide guidance to wind developers about where particularly sensitive wildlife areas existed that would preclude the construction of large wind turbines consistent with the purpose of the coastal statutes. Therefore, engineering considerations that would prevent wind installations from being constructed were not considered in the mapping exercise. The Department does not agree that the map will preclude the development of large scale wind turbines in the coastal zone. For example, a large scale wind turbine was recently permitted in Union Beach, Monmouth County and the New York New Jersey Port Authority recently announced plans to construct five 1.5 MW turbines in Bayonne.

145. COMMENT: According to the Department's Large Wind Turbine Siting Map Report, the Department used a single study (Everaert and Stienen 2006) of tern mortality caused by wind turbines in Belgium to develop the buffer limits for least terns and black skimmers. The study was conducted at a port in Belgium on tern species related to least terns. Although the study can offer insight into avian mortality caused by wind turbines, it should not be the deciding source when determining any buffers which would limit large scale wind turbine development in the CAFRA area for the following reasons:

1. The proposed buffer is not imposed on turbines of similar size encountered in the study. The turbines in the study range from 200 kilowatt to 600 kilowatt while the turbines directly in front of the tern colony are 400 kilowatt. These turbines would fall into the Department's tiers 2 and 3. The Department's buffer only applies to tier

4 turbines. As the study can directly determine avian impacts to smaller turbines, the proposed buffer should be imposed on tier 2 turbines and larger rather than just large scale turbines;

2. The smaller size of the study's turbines may directly determine the cause of higher avian mortality given the denser concentration of turbines in the wind farm. If larger turbines were used, the wind farm would require fewer turbines spaced further apart which may reduce avian mortality. If smaller turbines are built within the Department's proposed buffer, this scenario may come to fruition which may cause greater avian impacts than a few large-scale turbines in the same area;

3. The configuration of the study's turbines may not accurately reflect how turbines will be constructed in the CAFRA zone. The study's turbines are installed linearly along a breakwater with the tern colony directly behind them. In some cases, breeding can occur within 100 feet of the turbines. Turbines constructed in the CAFRA zone may not be built directly in front of tern colonies. This may lessen avian impacts as the terns would not fly directly through the line of turbines toward the foraging area;

4. Avian strikes only occurred during breeding periods. The researchers found that collision fatalities occurred during the breeding period and no collisions were identified during the rest of the year. If the pre-construction avian survey indicates the proposed project site is a foraging route, instituting curtailment during the breeding season may reduce impacts; and

5. The study's authors admit that research results of individual wind farms cannot be generalized. By using this study, the Department has generalized the impacts of wind turbines on terns and is excluding a productive wind resource from the CAFRA zone. The researchers admit that, in general, collision mortality is related to number of flying birds present rather than size of the turbine, but more research is needed on avian impacts to large scale turbines. The Department should review each project's pre-construction avian survey and, if needed, curtailment could be instituted.

Rather than excluding large-scale wind development from certain areas of the CAFRA zone, the Department should instead review both the configuration of the proposed wind farm (regardless of size) and the pre-construction avian survey results to see if the Belgium study matches the conditions at the proposed site and, if needed, institute a curtailment requirement to reduce avian impacts. This would allow construction of the turbines while allowing the Department to gather valuable information concerning avian impacts from large-scale wind development. It is recommended that CAFRA permits allow curtailment to be discontinued if either post-construction avian surveys or other research indicate birds are adjusting to the operation of the turbine. (37)

RESPONSE: Because of the sensitivity of certain areas due to migratory patterns, presence of threatened and endangered species and other circumstances, the Department has used the data available to map those locations where it already has sufficient information to determine that wind turbines 200 feet in height or taller or having a cumulative rotor swept area greater than 4,000 square feet are unacceptable due to operational impacts of the turbines on birds and bats. The rule contains provisions for changing the map. Such changes may occur to the map only after sufficient monitoring data for the Mid-Atlantic region has been collected and analyzed. If that information indicates there is no cause for concern and that conclusion is supported by any additional peer-reviewed literature, the map will be adjusted accordingly. Species surveys at a site by the applicant during the permit process do not constitute such information and will not result in changes to the map. There is limited published species-specific data available which is why only one study is cited related to tern mortality.

Since the cited study has shown that terns are affected by wind turbines and since least terns are an endangered species, the Department mapped the area surrounding the nest and between the nest and foraging habitat to protect the colony. Curtailment may be required in areas where a wind turbine is approved outside of but in proximity to a mapped area, but the Department does not believe curtailment alone is sufficiently protective for this endangered species.

The Department agrees that research results of wind farms are difficult to generalize, which is one of the main reasons that pre- and post- construction monitoring is required for large scale projects. In the face of this dearth of data, the Department has chosen a more conservative route which is subject to revision pending additional data. These revisions could include changes to the curtailment condition, which is not a mandatory 360 hours/year, but rather the maximum that can be required if a problem arises at a particular site.

146. COMMENT: The Department's proactive stance in regard to both renewable energy and protection of fish and wildlife resources, as demonstrated by the Department's Large Scale Wind Turbine Siting Map Report and Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits is appreciated. (35)

RESPONSE: The Department acknowledges this comment in support of the rule.

147. COMMENT: The proposal summary and the Large Scale Wind Turbine Siting Map Report note that the wind turbine size restrictions in these mapped areas apply only to wind turbines constructed on land. However, it is not clear at N.J.A.C. 7:7-7.31(a)4iii that these areas of restriction are only on land and that the one-quarter mile restriction applies only to land areas, that is areas landward of the mean high water line. The rule text at N.J.A.C. 7:7 and 7:7E should be modified to state that the restrictions to wind turbines on the Large Scale Wind Turbine Siting Map are applicable only to land areas. The text should also be modified to provide that the one-quarter mile setback restriction applies to land locations only. (28)

RESPONSE: The general permit at N.J.A.C. 7:7-7.31 applies only to wind turbines proposed on land. The requirement that the turbine be constructed on land is found at N.J.A.C. 7:7-7.31(a)3i.

148. COMMENT: The Department's "Areas Off-limits to Large Scale Wind Map" when compared to the New Jersey Wind Resource Maps eliminates 95 percent of the State's wind resources. How does the Department expect the Governor's Energy Master Plan to be satisfied for terrestrial based wind power generation if 95 percent of the State's resource is off-limits?

The Department should re-evaluate the map based on avian information that has a direct bearing on the conditions existing in New Jersey. If the map is not re-evaluated to allow use of the high productivity wind areas, then land-based wind energy facilities are dead in New Jersey. (14)

149. COMMENT: The rules eliminate wind as a use on more than 400 square miles of New Jersey coastal areas without a site specific assessment of the real impacts to wildlife. The criteria relating to appropriate scientific support is so arbitrary that it does nothing other than stop the use of wind as a source of generating electricity. (5, 44)

RESPONSE TO COMMENTS 148 AND 149 ABOVE: The Department carefully evaluated the land in the coastal zone and prepared a map that identifies specific areas on land where wind turbines 200 feet in height or taller or having a cumulative rotor swept area of greater than 4,000 square feet are unacceptable due to operational impacts of the turbines on birds and bats. Areas identified on the map are those areas where the Department currently has wildlife data to make the determination that a wind turbine of this size would pose a significant risk to birds and bats and would not comply with existing rules. Mapping these areas makes it clear to potential wind developers that large scale turbines proposed in these areas are unacceptable.

150. COMMENT: The Department should institute a CAFRA individual permit program for large scale land-based wind turbines identified on the Department's Large Scale Wind Turbine Siting Map. The program could follow the pre- and post-construction monitoring requirements for tier 4 turbines as set forth in the Department's

Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits, but, based on the pre-construction results, require curtailment. (37)

RESPONSE: As stated previously, the Department's Large Scale Wind Turbine Siting Map identifies specific areas on land where based on current wildlife data, large-scale wind turbines (200 feet in height or taller, or having a cumulative rotor swept area greater than 4,000 square feet) would pose an unacceptable risk to birds and bats during operation. Construction of large scale wind turbines in the mapped areas is unacceptable due to operational impacts on birds and bats. Accordingly, based upon current information, curtailment would not be a viable option in these areas. The Department will use the results of the monitoring of wind turbines in the State and elsewhere as well as evaluate published and unpublished studies or data to make any appropriate amendments to the rules.

151. COMMENT: Wind resources improve near the coast because of the relatively low surface roughness of the ocean and the occurrence of summer sea breezes. Many barrier islands as well as exposed points such as Cape May are predicted to have a class 3 wind resource and in places may reach class 4 (7 meters per second or higher at 70 meters). In general commercial wind power projects using large scale turbines require a mean speed of at least 7 meters per second. Small turbines are designed to operate at lower wind speeds and may be useful at mean speeds as low as 5 to 6 meters per second (Brower 2002). Given this modeling data, the Department through its Large Scale Wind Turbine Siting Map is excluding a large swath of favorable wind resource from large scale wind development and will make the land-based wind powered renewable goals outlined in the 2008 Energy Master Plan nearly unachievable.

The "acceptable" areas on the Department's Large Scale Wind Turbine Siting Map are not conducive to large scale wind development. The Department has proposed to prohibit large scale wind development on approximately 39 percent (approximately 238,000 acres) of the CAFRA area (approximately 616,000 acres), leaving approximately 378,000 acres acceptable for large scale wind turbine development. The remaining

"acceptable" areas, according to the Department's 2002 land use land cover geographic information system data, are mostly wetlands, urban land, small agricultural tracts, or forests. These land types are either not acceptable for large scale wind development and/or carry their own environmental permitting concerns (37)

RESPONSE: The Department understands that the more preferable sites for wind turbines are found along New Jersey's coast. These rules are intended to promote wind development in areas of the State where it is appropriate while not allowing wind turbine development in areas where the operation of wind turbines poses a significant risk to birds and bats. In developing the map, the mapped areas were tightly drawn. Of the total area within CAFRA and upland waterfront jurisdiction, approximately 29 percent is subject to automatic restriction due to the operational impacts of wind turbines on birds and bats. Of the 29 percent, approximately 70 percent or 168,600 acres is wetlands and thus is already subject to development restrictions due to the sensitive nature of wetlands and their myriad environmental benefits.

152. COMMENT: The Department does not have enough scientific data to completely prohibit large scale wind development. According to the New Jersey Board of Public Utilities, some of the most productive land-based wind turbine areas are in the CAFRA area. The Department's Large Scale Wind Turbine Siting Map report includes a handful of published data on the subject of avian and bat issues as they relate to turbines. A more constructive approach would be to allow construction of large scale wind development throughout the CAFRA zone and require both pre- and post- construction avian surveys and require curtailment during seasonal migration periods using weather monitoring and/or avian radar equipment to reduce avian impacts. If the post- construction avian surveys indicate the birds are adjusting to the turbine operations, the operator could be given the option of discontinuing curtailment. This way, the Department could gather much needed data while still allowing the renewable energy goals of the 2008 energy Master Plan to be met. (37)

RESPONSE: Pre-and/or post-construction monitoring results will be used by the Department to evaluate the impacts of turbines and determine the extent to which operations are causing direct mortality to birds and bats. Monitoring results and the review of published and unpublished scientific data will assist the Department in determining appropriate curtailment provisions and whether amendments to the rules are necessary. There are however, areas that, based on current wildlife data, are unacceptable for the siting of wind turbines due to operational impacts to birds and bats. The Department does not believe it would be appropriate or responsible to allow unfettered development to occur before sufficient information is available to determine the impacts from that development with the hope that curtailment will be sufficient to control any impacts, especially where studies are available demonstrating that potentially significant impacts have occurred in other locations. The rule contains provisions for changing the map. Such changes may occur to the map only after sufficient monitoring data for the Mid-Atlantic region has been collected and analyzed. If that information indicates there is no cause for concern and that conclusion is supported by any additional peer-reviewed literature, the map will be adjusted accordingly. Species surveys at a site by the applicant during the permit process do not constitute such information and will not result in changes to the map.

153. COMMENT: The Department is proposing to revise the Large Scale Wind Turbine Siting Map based on new information on species occurrence, new information on appropriate buffers, or new information on impacts developed from ongoing monitoring or from published and unpublished studies or data in order to minimize adverse effects on birds and bats. It is recommended that the Department delete “in order to minimize adverse effects on birds and bats” as this language suggests that the map will only be revised to make it more restrictive to wind turbine development. If studies prove that a particular turbine prohibited area on the map is not needed, the map should be revised to remove the particular area. The Department, as a body of scientists, should realize that as the body of scientific evidence concerning a particular subject or field matures, public policy should reflect that change, rather than excluding a particular activity altogether

regardless of where the evidence points. This would open more coastal areas to wind turbine development and further the 2008 Energy Master Plan. It is scientifically appropriate for site-specific studies to supersede prohibition or exclusion areas which were developed on limited information and use of generalized buffers. It is recommended that a specific provision be included for an applicant to submit site-specific data for locations within areas otherwise mapped as prohibiting large scale wind turbine projects. (37)

RESPONSE: The Department indicated throughout the rule summary that it requires more information about the impacts of wind turbines on birds and bats in the coastal zone. This is in large part the basis for the monitoring requirement of the rule. The proposal also contains a list of literature that assisted in the development of the rule. As indicated in the proposal, the Department will review the evolving literature as this use becomes more common in the coastal zone. The Department indicated its intent to evaluate scientific literature as well as monitoring results to make appropriate changes to the rules, map and technical manual. The purpose of the map is to minimize the operational effects of wind turbines on birds and bats. Development of large scale wind turbines in the mapped areas is unacceptable at this time. Changes may occur to the map only after sufficient monitoring data for the Mid-Atlantic region has been collected and analyzed. If that information indicates there is no cause for concern and that conclusion is supported by any additional peer-reviewed literature, the map will be adjusted accordingly. Species surveys at a site by the applicant during the permit process do not constitute such information and will not result in changes to the map. Revisions to the map may result in additional areas being mapped or areas that are currently mapped being removed. In either case, such revisions minimize the operational effects of wind turbines on birds and bats. The Department has amended the rule on adoption to clarify this.

154. COMMENT: The most problematic aspect of the proposed rules is that there is no allowance for exceptions. For example, the Large Scale Wind Turbine Siting Map defines an exclusion area for the construction of such turbines. What is unfortunate is the

fact that there are a number of sites within the exclusion area, such as those in urban or industrial areas, where turbines would not be near important wildlife habitat. Such areas would include sites that are several hundred meters or more from wildlife habitat. Those sites are already environmentally degraded so that they do not attract wildlife. Housing, amusement parks, parking lots, and similar development should not be excluded from consideration of wind power. Allowances for exceptions to the rules would appear to be a rational means of protection wildlife habitat while still allowing for the development of renewable energy. (18)

RESPONSE: The rules do not prohibit the construction of wind turbines in developed areas. The Large Scale Wind Turbine Siting Map addresses the siting of large scale wind turbines, that is wind turbines 200 feet in height or taller or having a cumulative rotor swept area greater than 4,000 square feet. The mapped areas were drawn conservatively; mapping only areas where the Department has current wildlife data to make the determination that the operation of large-scale wind turbines would pose a significant risk to birds and bats. The map does not prohibit the construction of wind turbines under these thresholds. Furthermore, birds and bats do fly over these more developed area and therefore could be adversely affected by wind turbine operations.

155. COMMENT: The siting restrictions in the rules seem to be motivated by avoiding bird kills. The Department cannot develop rules whose sole purpose is the avoidance of killing one bird. Instead the rules should consider the new environmental impact of all energy development and in doing so, wind and solar energy would be the best choice. (12)

RESPONSE: The Department agrees that renewable energy is important to New Jersey. In light of this importance, the Department exempted or fast tracked wind and solar projects that met certain criteria as well as reduced setback requirements under the Coastal Zone Management rules' energy facility use rule. However, as the size of wind turbines increases, the potential for impacts to birds and bats also increases. Therefore, it

is appropriate for the Department to evaluate large scale wind turbines to minimize adverse effects and assure that significant impacts do not occur.

156. COMMENT: The Department's declaration that the Large Scale Wind Turbine Siting Map adds predictability because areas identified on the map are those areas where the Department currently has wildlife data to make the determination that a wind turbine 200 feet in height or taller, or with a cumulative rotor swept area of greater than 4,000 square feet on a site would pose a significant risk to birds and bats and would not comply with existing rules is erroneous because:

1. The development of the Map appears to be focused on impacts to birds and bats and not how to best implement the NJ Energy Master Plan (which is a dynamic document);

2. The development of the Map does not appear to have considered the global effects as required under the Regional Greenhouse Gas Initiative, Governor Corzine's Executive Order 54, and the Global Warming Response Act;

3. The development of the Map does not appear to have identified acceptable losses of birds and bats; and

4. The development of the Map does not appear to have sufficient data on migrating bats in the coastal region of New Jersey. (27)

RESPONSE: The rules as a whole were developed to streamline permitting of wind turbines in the coastal zone by using a tiered approach to permitting and providing more predictability in decision making. These changes are expected to aid in implementing the Energy Master Plan by assuring that projects that will have limited impacts receive expedited review and approval (or, in the case of the permit by rule, will require no approval if all conditions are met) and also assuring that time and resources are not put into developing project plans and filing applications for projects that could not ultimately receive approval. The Map was developed using existing data sources to protect primary areas for migrating birds and endangered and threatened species of birds. The Atlantic County Utilities Authority site in Atlantic City is one of only a few sites in a coastal area where impacts to birds have been studied and data is readily available. Another is in the

Netherlands. The Department agrees that more data on migrating bats would be useful and will continue to evaluate data gathered in New Jersey and elsewhere. The Atlantic County Utilities Authority study is the only study in New Jersey where impacts to bats have been examined. Studies of the Atlantic City and Netherlands facilities These two studies are examples of the types of information that the Department could use to determine if any amendments to the rules or the siting map are appropriate.

Enforcement of permit conditions

157. COMMENT: On November 14, 2006 the United States Fish and Wildlife Service notified the Department that Community Energy, Incorporated, of Wayne, Pennsylvania, was not conducting the required post-construction bird surveys for the wind farm at the Atlantic County Utilities Authority site. Administrative Condition 5 of CAFRA Permit 0102-03-0012.1 required the permittee to monitor the site for a period of three years or six migratory periods following build-out of the project. Based on this notification, a post-construction monitoring contract was awarded to the New Jersey Audubon Society.

The permit also requires the permittee to mitigate for adverse impacts to State listed species. At the December 11, 2008 stakeholder meeting it became apparent that the Department had not taken action to date in regard to the documented mortality of osprey and peregrine falcon at the Atlantic County Utilities Authority site.

It is recommended that the Department continue to condition permits with the requirement to monitor and mitigate for adverse impacts to State-listed species. It is further recommended that the Department ensure that all permit conditions be respected and enforced in a timely manner. (35)

RESPONSE: Monitoring will not be required for wind turbines that qualify for the permit-by-rule at N.J.A.C. 7:7-7.2(a)12. Post-construction monitoring will be required for the first 15 wind turbine projects constructed under the coastal general permit at N.J.A.C. 7:7-7.30 and any wind turbines constructed under the coastal general permit at N.J.A.C. 7:7-7.31. In accordance with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3), pre-

and/or post-construction monitoring will be required for all wind turbines subject to an individual coastal permit. With respect to the monitoring of the first 15 wind turbine projects constructed under the coastal general permit at N.J.A.C. 7:7-7.30, the Department does not anticipate that significant mortality of birds and bats will result from turbines subject to the coastal general permit and believes that the data from the first 15 wind turbine projects will provide sufficient data to assess effects of these turbines on birds and bats. However, should that data show that the operation of these turbines is causing unanticipated mortality to birds and bats, the data would serve to guide the Department in adjusting the coastal general permit standards. Similarly, the Department will use the data gathered through the monitoring of wind turbines subject to the coastal general permit at N.J.A.C. 7:7-7.31 or individual coastal general permit and information from published or unpublished studies or data to refine the rules as appropriate. Curtailment of operations is one technique that minimizes impacts to birds and bats. With respect to the Atlantic County Utilities Authority site, the Department required the construction of osprey platforms as a form of mitigation to compensate for the impacts to this species. As stated previously, the Department is receiving data from the post-construction monitoring study currently underway at the Atlantic County Utilities Authority in Atlantic City. Final results from the study are anticipated to be available in the fall of 2010.

Pre- and post- construction monitoring for wind energy facilities

158. COMMENT: The Department is commended for recognizing the importance of ongoing monitoring of wind power projects to understand the impacts of these projects and allow for adaptive management to minimize negative environmental impacts. Specifically, the Department's focus and emphasis on data collection from the larger projects envisioned in the proposal and accompanying technical documentation is particularly useful for developing a better understanding of the impacts of these kinds of projects. (20)

RESPONSE: The Department acknowledges this comment in support of the rule. As discussed in response to comments 24 and 25, in response to comments, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules. As a result of that review, changes have been made to the technical manual. The Department has modified its guidance with respect to monitoring for turbines greater than 250 feet in height, based on the number of turbines proposed (See response to comments 170 through 174).

159. COMMENT: While the Department's proposal to use data collected from these sites to determine periods of curtailment during peak migration seasons is supported, the Department is urged to allow curtailment based on data collected cumulatively and to adjust the thresholds for development of wind projects in the rule based on subsequently gathered data. The Department must elucidate the manner in which it will use the data collected to modify the rule as necessary. All these measures will contribute to effective adaptive management. (20)

RESPONSE: The Department will use the results of the monitoring of wind turbines in the State and elsewhere as well as evaluate published and unpublished studies or data to modify the curtailment provision as necessary. For example, if an increase in the cut-in speed for wind turbines were implemented, and data showed a subsequent decrease in bat mortality, the Department would use such data to refine curtailment at other locations.

160. COMMENT: The proposed rules represent a well-reasoned first step in promoting renewable energy while conserving the abundant wildlife that inhabits and travels through New Jersey's coastal zone. The rules will only be successful if the Department ensures rigorous and thorough data collection and habitat assessments, and conducts the long-term ecological monitoring based on the best available science which serves as a

foundation for a robust program of adaptive management. Much work lies ahead, but the Department is applauded for being one of the first states to develop a comprehensive regulatory framework for permitting the construction of renewable energy facilities in its coastal zone, while seeking to protect important wildlife populations. (47)

RESPONSE: The Department acknowledges this comment in support of the rule.

161. COMMENT: The economic impact statement provides that post monitoring studies are essential since wind turbines are a new use in the coastal zone and internationally and their effect not clearly understood. In order to protect these sensitive coastal resources, data must be gathered as these projects are constructed and operated to evaluate their effects. While wind turbines in New Jersey's coastal zone will be a relatively new use and data needs to be collected to assess the actual impact, it is not a new use internationally and should not be portrayed as such. Europe has used wind turbines, both on and off shore for many years and in some cases for decades. Perhaps there is some data that can be extrapolated from those installations and applied to New Jersey.

Wind turbines have also been used on many farms in the Midwest and Western regions of the United States since the early 1920s, many of which are in the migratory routes of various avian species. Again, perhaps there is some applicable data that can be extrapolated for use in New Jersey. (11, 14)

RESPONSE: The language that the commenter is referring to was in reference to the monitoring requirements for wind turbines located in the tidal waters. The economic impact statement states that the "costs for habitat evaluation and post construction monitoring for wind turbines located in tidal waters would be higher [than wind turbines on land] due to the nature of operating in the marine environment. These studies are essential since wind turbines are a new use in the coastal zone and internationally and their effects not clearly understood. In order to protect these sensitive coastal resources, data must be gathered as these projects are constructed and operate to evaluate their effects."

The Department recently completed a baseline study in the ocean waters offshore of New Jersey, releasing a final report in July 2010. The Department gathered data regarding the abundance and distribution of birds, marine mammals and sea turtles in an area that reaches 20 nautical miles offshore, between Seaside Park and Stone Harbor. All wind power impacts data in the United States has been collected in terrestrial systems. Using methods utilized in European studies of offshore wind power, the baseline study assessed the spatial and temporal distribution (including migratory and resident species), of birds, marine mammals and sea turtles, and compiled data on marine fish and shellfish off the coast of New Jersey.

For wind energy facilities in tidal waters, the Energy use rule requires a habitat evaluation, impact assessment and post-construction monitoring to establish the abundance, distribution, and behavior of avian species, bats, and marine organisms and assess the impacts of the construction and/or operation of these facilities on these species. Although the Department is gathering data regarding the abundance and distribution of birds, bats, marine mammals and sea turtles through Ecological Baseline Studies, they are at a broad rather than site-specific scale. Moreover, there is no information regarding impacts to avian species, bats and marine organisms from offshore wind turbines in the United States. The Department has extensively reviewed literature pertaining to modern wind turbines, including offshore turbines, although these installations may have been constructed in different environments where different species are present. This includes the literature summarized in the proposal, the Department's Large Scale Wind Turbine Siting Map Report and Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits. Applicants will be required to gather information on species composition, abundance, distribution, behavior and, for avian species and bats, flight pattern heights, as well as collisions and behavioral changes associated with wind turbine construction and/or operation. This information will be used to determine the acceptability of wind turbines at a specific location in tidal waters, with the scope and nature of the evaluation dependent on a project's proposed location.

The turbines used on farms in the mid-west in 1900s were generally individual turbines and relatively small compared to the modern turbines in New Jersey. Most of

the small turbines from farms in the 1920's would generally qualify for the permit-by-rule and would be of the class that the Department has determined are not likely to cause significant impact. Accordingly, information regarding the operation of these turbines would be of limited usefulness in analyzing the potential impacts of modern large scale turbines.

162. COMMENT: The economic impact statement says that the coastal general permits include a requirement for post-construction monitoring for birds and bats and that the Department estimates that this monitoring will cost $15,000 to $20,000. To add this cost to wind turbines with a rotor swept area over 2,000 square feet will likely result in many of these potential small business projects not moving forward, which will result in the overall development and use of smaller wind turbines for renewable energy in New Jersey being stifled. This is an extremely onerous requirement for small wind turbines with a rotor swept area of over 2,000 square feet. The Department should consider alternative means to monitor the impact on birds and bats, rather than burden individual users. (11)

163. COMMENT: The requirement for the first 15 wind turbine developments under the coastal general permit at N.J.A.C. 7:7-7.30 to include post-construction monitoring is an unfair economic impact to the first 15 projects. As noted in the economic impact analysis, post-construction monitoring is quite expensive. The Department must explain why it chose the first 15 projects and how this provision is consistent with the United States and New Jersey Constitutions. (27)

RESPONSE TO COMMENTS 162 AND 163: Post-construction monitoring is required for the first 15 wind turbine developments (ranging in scope from one to three turbines) constructed under the coastal general permit at N.J.A.C. 7:7-7.30. Data gathered from post-construction monitoring of the first 15 wind turbine developments greater than 2,000 square feet in size will enable the Department to evaluate the impacts of these turbines, and determine if operations are causing unanticipated levels of direct mortality to birds

and bats. If it is determined that unanticipated mortality is occurring, this information would serve to guide the Department in proposing adjustments to this coastal general permit, and may be used to curtail turbine operations as provided at N.J.A.C. 7:7-7.30(b). Because the Department does not anticipate that significant mortality will result from turbines that meet the criteria of this general permit, it believes that data from the first 15 projects constructed will provide sufficient information to assess the effect of these turbines on birds and bats. Post-construction monitoring shall consist of bird and bat carcass searches conducted for one full year beginning immediately after the wind turbines begin operation. Neither the State nor Federal Constitution precludes the Department from developing information necessary to assure that any environmental impacts from operation of wind turbines of this size are acceptable.

164. COMMENT: The Port Authority of New York and New Jersey is evaluating its Port Jersey facility for the construction of at least 5 large-scale wind turbines with a power rating ranging from 7.5 to 12.5 MW. A meteorological tower has been constructed on site and has been collecting data for the past 9 months. In August 2009, pre-construction bird and bat studies commenced. The wind data has been shared with the New Jersey Board of Public Utilities. The rules require very expensive radar and sonar studies which would likely require the project to forego the benefits of Federal stimulus money because of the time required to complete the required studies. However, the Department has not approved the pre-construction bird and bat monitoring program presumably because no radar studies are included, and has not opined on a suggested alternate approach. (49)

RESPONSE: Comments submitted on a particular project are beyond the scope of a rulemaking adoption. However, as discussed in response to comments 170 through 174, the technical manual has been modified with respect to radar surveys. The Department will make a case-by-case determination on the need for a radar survey where five or more land-based turbines are proposed and no radar will be required for installations of four or fewer turbines. Such determination will be made taking into account the number of

turbines, the size of turbines, and the proposed location for the turbines, particularly their proximity to water, wetlands, and nesting and foraging areas.

165. COMMENT: The pre- and post- construction monitoring for offshore wind turbines should be of a limited duration which is appropriate to the scale and impact of the proposed project. The monitoring should not be required in advance of issuance of a permit. For a demonstration project, a one year preconstruction and one year post construction monitoring program should be sufficient. The State should, to the extent practicable, support such monitoring for a demonstration project with grant funds, or the application of Regional Greenhouse Gas Initiative (RGGI) funding. (6)

166. COMMENT: The rule and technical manual require habitat evaluations, including species surveys for offshore wind projects. According to the technical manual, these surveys must be conducted prior to submission of an application and the results included in the application. In general, this requirement is supported. However, for the demonstration project, the required species surveys should be allowed to be conducted concomitantly with the review and issuance of the permit, with the permit issued during the process of the surveys and with the completion of the surveys being a permit condition of the permit for the following reasons:

1. Only one demonstration project is allowed, and additional demonstration projects will be economically unfeasible;

2. The scale of the demonstration project in relation to the 80+ wind turbine generators of utility scale projects means the impact will be proportionally smaller;

3. The demonstration project is within the Ecological Baseline Study Area, where the study was funded by New Jersey taxpayer resources and should be utilized for the analysis of siting, i.e. more than an intellectual exercise or pure science, the 23 month study should be used as applied science;

4. Since the final report for the Ecological Baseline Study will not be available until July 2010, an applicant for the demonstration project could utilize the data collection boat

observation techniques of the Department's study to initiate the species studies this spring, while the final report is being prepared;

5. Permit conditions could stipulate that construction of offshore components of the demonstration project cannot begin until after at least one full year covering both the Spring and fall migration periods has been completed;

6. The Ecological Baseline Study has sufficient data along with data gathered by the Fisherman's Energy Avian Risk Assessment and the size of the demonstration project to conclude there is no risk; and

7. There is no timely alternative for a demonstration size project in the offshore waters of New Jersey because:

i. Federal projects are too many years away due to the MMS permitting process;

ii.. Federal water projects do not lend themselves to smaller scale projects as a result of even greater financial expense;

iii. Other areas along the New Jersey coast from Stone Harbor to Seaside Heights do not offer the public support needed to build a near shore state waters project;

iii. Currently, only off of Atlantic City will the Department find overwhelming public support for this type of offshore wind farm project; and

iv. If the Department wants to measure the environmental impacts of an offshore wind farm, as a demonstration and a first step to a new industry, it has no other good alternatives in State waters, while the scale of the project and the Department's currently available information indicate that the impacts of such a small scale project present no risk.

A 25 MW or less demonstration project cannot afford the delays and cost of holding an application in abeyance until additional species surveys are conducted as a condition of submitting the application. The perceived risk of regulatory refusal and delays are simply too high. If the State insists upon preapplication submittal studies without any prior commitment as to the outcome of the application, then the demonstration project will likely not proceed. (6)

167. COMMENT: Preconstruction studies for offshore wind development are necessary. Using the vessel intercept and other techniques consistent with the existing 23 month Ecological Baseline Study data collection effort, preconstruction surveys for the demonstration project could begin in the spring, even prior to the issuance of the Ecological Baseline Study final report. By allowing a pre-construction survey in lieu of a pre-permitting survey, the demonstration project could continue on such a timeline as to be the first offshore wind project in the United States. Preconstruction surveys should be a condition of a coastal permit rather than a pre-application requirement because:

1. The 23 month Ecological Baseline Study work done by GMI has significant data which can augment a preconstruction survey and the information collected to date should be sufficient to conclude the risk of a small demonstration offshore wind farm is not significant. Arguably, the existing 23 month survey is the baseline study to compare post construction impacts of a demonstration wind farm contemplated by the Blue Ribbon Panel Report. Because the rule requires the demonstration project to be located within the study area, it would not require a pre-application study. Rather, the demonstration project would only require a more detailed site specific one year pre-construction study to augment and supplement the 23 month study;

2. The scale of the demonstration project is so small that impacts are likely to be commensurately small;

3. A key function of the demonstration project from the State's point of view is both development of green technology industry and job creation. Thus, the ability of the demonstration project to initiate competitive manufacturer interest in New Jersey as a place that is actually building and not just talking about offshore wind is paramount. New Jersey's ability to attract these manufacturers competitively, most of whom can justify a maximum of one East Coast regional manufacturing facility, largely depends on getting to the head of the line, that is, enabling a project to be built first in the United States. For the demonstration project, pre-permit application species studies which most likely cannot be financed would add 18 to 24 months and the race for jobs in New Jersey would be seriously stalled. Other coastal states have targeted offshore wind for

manufacturing/green jobs, many with economic development and tax policies that already put them at an advantage over New Jersey; and

4. Environmental groups are supporting the commenter's demonstration project with the intention that it measures environmental impacts and because it is small scale.

Therefore, the rule should be amended on adoption to clarify that all offshore wind projects require one year pre-permit submission species studies except for the demonstration project within the Ecological Baseline Study Area for all the reasons listed above. For that project, permits can be applied for and issued, with permit conditions including the satisfactory completion of pre-construction avian monitoring. (6)

RESPONSE TO COMMENTS 165 THROUGH 167: The technical manual contains the Department's guidance and interpretations regarding the monitoring requirements set forth in the Coastal Permit Program rules, N.J.A.C. 7:7 and Coastal Zone Management rules, N.J.A.C. 7:7E. In response to comments received, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules. As a result of that review, the Department has modified the technical manual with respect to the demonstration project to provide that one year of preconstruction surveys is not required as a component of the habitat evaluation. Rather, existing data and scientific literature, along with targeted survey work such as bathymetry, identification of shoals and bottom type will be used to evaluate habitat and assess impacts of construction and operation and demonstrate compliance with applicable rules. Once a permit has been issued, the developer of the demonstration project will be required to conduct one year of pre-construction monitoring. However, the Department continues to believe that, due to natural variability, two years of post-construction monitoring is necessary. The Board of Public Utilities has been working with offshore wind developers to assist in monitoring costs through funding of meteorological towers.

168. COMMENT: The Department should condition permits with the requirement to monitor and mitigate for adverse impacts to State-listed species or other bird species found dead at the project site by providing substitute resources or environments. (35)

RESPONSE: The first priority will be to reduce the potential for impact by properly siting turbines in lower risk areas. The Department has mapped those areas where current information indicates that a large scale wind turbine would pose a significant risk to birds and bats. State-listed species were considered in developing the map. Outside of the mapped areas, the Department will also consider State-listed and other bird species in reviewing an application, and may not approve a particular project due to potential operational risks. Alternatively, the Department may require mitigation as a condition of a permit, as it did for the Atlantic County Utilities Authority wind turbine facility. The Department will closely monitor impacts to State listed species and address issues as necessary.

169. COMMENT: While wind and solar energy rules provide for reduced pre- and post-construction avian and bat monitoring in limited circumstances, the rules impose these monitoring requirements uniformly on all turbines in excess of 200 feet in height, including blades and towers, regardless of the number and density of turbines proposed in a given area. Turbines of less than 200 feet in height have limited application and generally have ratings of 100 kilowatts or less. In seeking to facilitate only the development of small wind energy, the proposal will severely hamper achievement of the 2008 Energy Master Plan's onshore wind goal.

A major concern regarding the proposal and technical manual is the absence of a means of negotiating pre- and post- construction wildlife studies on a site-by-site basis. The technical manual applies to all projects involving large wind turbines whether the project would consist of one or 100 turbines. This inflexible approach is not appropriate in light of the absence of probable risk associated with small projects. (13)

RESPONSE: As discussed in response to comments 170 through 174, the Department, in

response to public comments, has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules is developed. As a result of that review, the Department has modified its guidance with respect to monitoring for turbines greater than 250 feet in height, based on the number of turbines proposed.

170. COMMENT: The burdensome pre- and post-construction avian and bats monitoring requirement of the proposed new rules will have an adverse impact on the financing of alternative energy development. The inordinate costs associated with these requirements and the fact that a substantial portion of these costs will be borne by the project prior to agency decision-making on permit applications are dissuasive to wind development in New Jersey. Wind-to-energy projects are expensive to construct and operate approximately one-third of the time in producing energy. As a result, project economies rely upon public funding from sources such as renewable energy credits and publicly funded grants and subsidized loans. The economic benefits inuring to the host facility justifying these projects demands that costs be carefully controlled in order to capture the value of the energy produced to compensate both the host community and the project sponsor. Currently, the estimates of cost for the proposed avian studies would consume between one and two years of the full economic benefit of the project. Projects are typically justified on a fifteen year expected life and this contemplates the elimination of nearly 15 percent of the life cycle savings. To collect three years of continuous radar data from two sources without sufficient scientific justification warranting this extraordinary financial burden is burdensome and unwarranted. (13)

171. COMMENT: The Department's proposal indicates that completing the required pre- and post-construction avian and bat monitoring is likely to cost in excess of $200,000 to $400,000 and visual surveys an additional $150,000. Early private sector estimates of compliance costs are twice the Department's cited figures. Given that a

single 1.5 megawatt turbine (Tier 4 wind turbine) is anticipated to have construction costs of $5,000,000 to $7,000,000, the required pre- and post- construction monitoring is likely to increase the cost of a single turbine by as much as 15 percent. Given that much of this cost would be borne early in the project's planning, the increased pre-development cost could easily render single turbine projects too risky to pursue. (13)

172. COMMENT: The expense associated with the monitoring requirements for small wind turbine projects could exceed $1 million and is unwarranted for two reasons. First, it has not been demonstrated that wind projects, including one and two turbines, involving modern turbines result in significant impacts to birds. In light of the absence of significant impacts to birds at modern utility scale turbines, the Department must explain why such extensive monitoring exceeds that needed to permit other types of coastal projects which threaten much larger numbers of birds. Second, many of the methods set forth in the manual have not been proven to be precise or reliable indicators of risk or impacts. Although millions of dollars have been invested in these studies to date, the numbers of birds impacted have proven to be too small to be predicted precisely. The Department has failed to explain how radar and other studies have been used to predict risk with precision. (13, 18)

173. COMMENT: The proposed monitoring requirements decrease the economic feasibility of wind energy. It is requested that the Department refine its monitoring requirements so as to ensure the cost is not prohibitive, perhaps including a cap, for example no more than five percent of the total system cost. The interval from a rotor swept area of 4,000 square feet to 20,000 square feet is quite wide and the costs of $150,000 to $400,000 would be prohibitive to the smaller projects. (7)

174. COMMENT: The Department should amend the rules on adoption to eliminate the requirement for pre- and post- construction avian monitoring on projects that would result in five or fewer turbines, of any size, within an area of 50 acres or less. Similarly, the Department should modify the definitions of wind turbine project tiers provided in the

draft technical manual on adoption to increase the threshold of wind turbines where pre- and post-construction monitoring is required to 5 for all tiers so long as no more than a total of five similarly classified turbines are located within a surrounding area of 50 acres. Alternatively, the Department should withdraw the draft technical manual and instead require scope and detail of the monitoring be determined on a case-by-case basis considering the particular resources associated with the specific project site. (13)

RESPONSE TO COMMENTS 170 THROUGH 174: The technical manual contains the Department's guidance and interpretations regarding the monitoring required under the Coastal Permit Program and Coastal Zone Management rules for wind turbines. The technical manual released for public comment with the rule proposal on September 8, 2009 did not call for three years of continuous radar monitoring. Radar studies applied only to Tier 4 wind turbines, that is turbines greater than 250 feet in height or having a cumulative rotor swept area of 20,000 square feet. As part of the one year pre-construction and two year post-construction monitoring, radar studies were only to be conducted for the periods of April 15 to May 15 and September 15 to October 31 at the project site and reference site. Nevertheless, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under the Coastal Permit Program and Coastal Zone Management rules is developed. As a result of that review, various changes have been made to the technical manual. (See http://www.state.nj.us/dep/landuse/windturbine.html.) The Department has modified the technical manual with respect to monitoring of turbines greater than 250 feet in height, based on the number of turbines proposed. Specifically, where five or more large-scale wind turbines are proposed, the Department will conduct a case-by-case review of the project to determine when radar monitoring will be necessary, taking into account the number of turbines, the size of turbines, and the proposed location for the turbines, particularly their proximity to water, wetlands, and nesting and foraging areas. For

projects consisting of less than five turbines, radar surveys and monitoring at a reference site have been eliminated.

The monitoring requirements for land-based turbines are not put into effect until after a permit has been issued, and do not effect the ability of a permittee to construct a project. Therefore, they would not increase the risk of a project. Based upon the information available, the methods outlined in the technical manual will help guide wind development in the coastal regions of the State. As further information is developed and becomes available, the Department will continue to determine where changes can be made to the rule and technical manual that will both protect the environment and promote renewable energy.

175. COMMENT: Due to the increased importance placed on renewable energy sources by the Department of Defense, it is highly likely that renewable energy facilities, including wind turbines, may be constructed at Department of Defense installations in New Jersey. The Department of Defense is concerned about the potential impact of avian and bat surveys that are included in the proposed regulation for general and individual permits. Specifically:

1. What happens if the Department reviews a pre-construction avian and bat survey and determines that the proposed project may impact avian and/or bat species? In such situations, does the Department plan on including permit language similar to an incidental take statement under Section 7(b)(4) of the Endangered Species Act to address potential kills or will some other approach be used to set permit limits?

2. If a “kills statement” is used, how will the Department calculate an acceptable number of kills? Furthermore, will kills be limited to State and/or Federal listed species or will it include all avian and bat species? Including all bat and avian species in a “kills statement” could subject a permittee to a significant regulatory burden that may ultimately discourage the development of land-based wind turbines in New Jersey. (41)

RESPONSE: For wind turbines located on land, the decision as to whether to issue a permit will not based on pre-construction monitoring. Rather, the decision will be based

on compliance with the applicable rules, especially the endangered and threatened wildlife habitat and critical wildlife habitat special area rules, and the energy facility use rule. The pre-construction monitoring would be conducted after the permit is issued and prior to construction of the turbine. Regardless of the pre-construction monitoring results, the permittee would be able to construct their turbine(s). The pre-construction monitoring will be used in conjunction with the post-construction monitoring to evaluate the impacts of the operation of the turbines and determine if changes to the curtailment requirements or the rules are necessary. The Department does not anticipate setting an acceptable "kills" number and has not found any situation where the Federal government set an acceptable "kills" number for birds associated with wind turbines. Rather, the Department is more likely to review pre- and post- construction data from various projects in the State, compare it to national and international averages, take into account the species affected and make determinations as to whether curtailment or other actions are required.

176. COMMENT: If post construction avian and bat surveys identify kills, would the Department routinely require the turbine(s) to curtail operations; and if so, how long would operations be curtailed? (41)

RESPONSE: Curtailment is an option the Department has under the rules to minimize the impacts of the operation of certain wind turbines where it is expected that there is an impact to birds and bats. Curtailment may not be required of each wind turbine facility and may not be required in each year or season. Under the rules, the curtailment is limited to a maximum of 360 hours per turbine in a calendar year.

177. COMMENT: If the Department requires curtailment of operations without including a "kills statement" in the permit, how will curtailment be implemented? If the Department fails to include a "kills statement" in a permit or fails to address avian and bat kills in the permit, both the Department and the permittee will be at a disadvantage when determining the operational limits of the turbine. (41)

RESPONSE: As noted in response to comment 175, the Department does not anticipate setting an acceptable "kills" number and has not found any situation where the Federal government set an acceptable "kills" number for bird associated with wind turbines. Curtailment is a measure that will allow the Department to react to unanticipated significant impacts under certain conditions or during certain timeframes, and the Department has limited the potential curtailment for one calendar year to 360 hours per turbine. Unless such unanticipated impacts occur at a level that the Department determines requires immediate action, it is unlikely that curtailment will be required in the first year after initial permits are issued as data is gathered during operation under all conditions and time periods. The Department will notify the permittee in writing when curtailment is required for the permitted facility. The Department will also post the curtailment requirements on the Division of Land Use Regulation's web page. Such notification will be made by March 15th of the first year curtailment is required during the spring migration and by July 15th of the first year curtailment is required during the fall migration.

178. COMMENT: In stakeholder meetings, the notion of "acceptable avian risk" was raised, but not in the regulations. The regulations state the "permits-by-rule are limited in a manner that will assure that any development occurring pursuant to one of these permits will not have more than minimal adverse impacts on the environment, either separately or cumulatively…"" However, it is not clear how "minimal" is defined. (7)

179. COMMENT: Does the Department intend to publish acceptable avian and bat mortality data by species? (41)

180. COMMENT: The Department should establish an acceptable bird kill limit for all electric generating facilities. (12)

181. COMMENT: At the December 11, 2008 stakeholder meeting, concern about

mortality to birds and bats was raised and the identification of an acceptable level of mortality for birds and bats was discussed. Neither the proposal nor technical manual address acceptable losses for birds and bats; in fact, the rules are cited in several locations as being based on unacceptable levels of impacts to birds and bats. According to the Goodale (2009) report cited in the technical manual, wind farms are found to have less impact on birds measured by either fatality per gigawatt/hour or overall kills. This reference also notes that other sources of impacts on birds (e.g. cars, cats and buildings) estimated 500,000,000 to 1,000,000,000 fatalities annually, is in comparison to up to 37,000 birds annually by wind turbines. Raw numbers indicate that a banning of cats in coastal permits would be of greater benefit. (27)

RESPONSE TO COMMENTS 178 THROUGH 181: The Department does not intend to publish an acceptable mortality limit. Rather, the Department will review each wind turbine on a case-by-case basis considering, for example, the conservation status of the species likely to be affected, the number of species and individuals likely to be affected relative to other sites, and the national average of collisions. The Department appreciates that many other sources can impact bird populations more so than wind turbines, in part because there are so many more of them. However, that does not mean that the direct and indirect impacts of wind turbines should be ignored. To the contrary, it highlights the importance of being aware and controlling for these impacts since many of the species populations are already under so much pressure due to other anthropogenic factors.

182. COMMENT: The regulations discuss “motion smear” or “motion blur” as a risk to birds, quoting Hodos, 2003. In fact the article written by Hodos (2003) entitled “Minimization of motion smear: reducing avian collisions with wind turbines,” actually discusses techniques to reduce the negative impacts of Motion smear, such as painting blades. It seems that there ought to be mitigation measures that may make wind turbines “acceptable risks.” Defining an acceptable risk level may provide a better balance between protecting the environment and generating renewable energy that ultimately will

help preserve out environment.

An acceptable level of avian risk may in fact be a more effective criterion than rotor swept area, which does not necessarily correlate to avian fatalities. The commenter provided as an example, information on a wind harvesting product being tested that is represented to have a significant swept area that is, "the wings," but no rotating parts to threaten birds or bats. The commenter indicates that this company is not defining its device as a turbine but questions because it is a wind harvesting device, whether its swept area would be regulated and thus limited by the proposed regulations(7)

RESPONSE: As stated above, the Department does not intend to publish an acceptable mortality limit. Rather, the Department will review each wind turbine on a case-by-case basis. With respect to the product example provided by the commenter, it does not have a rotor swept area as defined by the rules because it does not move on a central rotor; rather, the wings move up and down. The product would be subject to an individual permit and would be required to comply with all applicable rules.

183. COMMENT: There are no avenues to negotiate pre- and post-construction wildlife studies on a site-by-site basis. The studies now being proposed as requirements for Tier 4 wind projects may not all be necessary for permitting small projects. In particular, small projects consisting of one to two turbines may only need some of the studies outlined by the technical manual. Such small projects have never been shown to cause undue adverse impact to wildlife, so it is unlikely that extensive studies are necessary for permitting such projects. In fact, such studies may not provide any indication of actual risk at a one to two turbine project that is located in degraded habitats or suburban/urban habitats. Therefore, the proposed rules need to incorporate some flexibility in their requirements for pre- and post-construction studies, based on specific conditions. (18)

RESPONSE: For wind turbines on land, the Department has taken a tiered approach to monitoring based on the size of the turbine. For tier one turbines, that is turbines less than 200 feet in height and having a cumulative rotor swept area of 2,000 square feet or

less, no pre- or post-construction monitoring is required. For tier two turbines, that is turbines less than 200 feet in height and having a cumulative rotor swept area of greater than 2,000 square feet to less than 4,000 square feet, no pre-construction monitoring is required and post-construction monitoring for one year is required in the form of carcass surveys. For tier three turbines, that is turbines 200 to 250 feet in height and having a cumulative rotor swept area of less than 25,000 square feet or less, no pre-construction monitoring is required and post-construction monitoring for one year is required in the form of carcass surveys. Last, for tier 4 turbines, that is turbines greater than 250 feet in height or having a cumulative rotor swept area greater than 20,000 square feet, pre- and post construction monitoring is required. However, as stated previously, in response to comments, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules. As a result of that review, various changes have been made to the technical manual. As stated previously, the coastal area of New Jersey is considered part of the globally significant migratory corridor as well as critical habitat to numerous resident species. As such, birds and bats fly over urbanized and non-urbanized areas of the State. The fact that an area is urbanized does not affect whether birds will fly over that area. Furthermore, the two coastal projects for which data is available indicate greater impact to birds and bats than in other landscape types.

184. COMMENT: While the Department suggests that post-construction monitoring is necessary to determine if constructed wind turbines are having "significant adverse effects," no guidance is provided regarding interpretation of such effects. Such determinations can have a substantial impact on the availability of wind-generated energy through the curtailment provision, and require early evaluation during the initial stages of project development. The latter point is quite significant and needs to be considered in context. In that regard, an important aspect of attracting capital investment to wind power is regulatory certainty and the availability of established regulatory standards. The

proposal falls short on both counts, and the result could pose a significant disadvantage for New Jersey relative to other States as each plans for increased reliance on wind power. (17)

RESPONSE: Curtailment of wind turbine operations is intended to reduce the impacts of the operation of wind turbines on birds and bats during peak migration periods. Curtailment will be required for specific wind turbine developments based on evolving science, including scientific literature and monitoring results in the State and elsewhere. Temporary shutdowns could be similar to those that are the subject of the current experiment that is taking place in Texas as discussed in response to comments 117 through 120. The rule provides that curtailment shall not exceed 360 hours in a calendar year per turbine within the normal range of operation of the turbine. The Department believes that 360 hours of turbine curtailment during a year is conservative given that coastal New Jersey lies along the Atlantic Flyway, which is a major migration corridor for many species. The diversity of species using this corridor results in migrating species moving through New Jersey's airspace for as many as nine months of the year (http://www.njaudubon.org/Research/records.html). Therefore 360 hours of potential (not necessarily actual) curtailment represents only 5.5 percent of the migration period. In addition, some curtailment may be accomplished through a change in the cut-in speed, rather than a total shutdown. This would likely result in low monetary losses as the generators do not produce a lot of energy at low wind speeds.

Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits

185. COMMENT: The Technical Manual for Evaluating Wildlife Impacts of Wind Turbines Requiring Coastal Permits and the Large Scale Wind Turbine Siting Map Report serve as the scientific and technical foundation on which the rules have been prepared. These documents are very thorough and the conclusions in them well-supported by extensive literature citations in reference to bird habitat and behavior. (47)

186. COMMENT: The treatment of bird and bat migration together with the treatment of wintering and breeding for birds in the technical manual is consistent with the available scientific data. (20)

187. COMMENT: The Department is commended for its technical manual which provides some clarity and consistency to potential wind facility developers on requirements and methodologies for data collection before, during and after facility construction. (10, 50)

RESPONSE TO COMMENTS 185 THROUGH 187: The Department acknowledges these comments in support of the rule. The final technical manual contains adjustments to the monitoring requirements. As discussed in response to comments 24 and 25, in response to comments, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules. As a result of that review, changes have been made to the technical manual. The Department has modified the technical manual with respect to monitoring for turbines greater than 250 feet in height, based on the number of turbines proposed (See response to comments 170 through 174). .

188. COMMENT: The general model by which the regulated communities collect and submit information to the Department can successfully build a knowledge base in which future policy refinements can be grounded. However, the technical manual as currently proposed provides insufficient specificity and transparency as to how this will be achieved. The Department should require that:

1. All documents and databases be submitted digitally to maximize access for scientists and researchers;

2. Once deemed complete, the submissions be available to the public via the internet to maximize transparency, better inform the regulated community and promote public involvement; and

3. In addition to submitting the reports and forms themselves, the data must be entered into a digital database that is available for: public review and scrutiny; academics at large who are interested in this applied ecological analysis; and the regulated community for making better informed decisions.

By requiring the regulated community to enter the information itself under appropriate regulatory oversight by the Department, the Department can avoid the significant delays and expense of resources that entering the data for the purposes of comparisons and stratified analyses would require. (20)

RESPONSE: The Department believes that items 1 through 3 identified by the commenter are good goals for the monitoring program and the Department will work towards those goals. However quality assurance/quality control will need to be addressed.

189. COMMENT: The Department should use standards for precision and accuracy of geographic data. For example, the monitoring protocol for migrating songbird surveys requires that the survey points be recorded by latitude and longitude. These standards should preclude anyone from being able to simply refer to topographical maps, which would not provide the degree of accuracy or precision considered necessary for scientific reporting standards. (20)

RESPONSE: The Department agrees with the commenter and the final technical manual specifies that survey points be recorded by latitude and longitude using a geographical positioning system unit.

190. COMMENT: It is requested that the Department provide evidence to support the rule's conclusion that the requirement that only the first 15 Tier 2 turbines conduct monitoring will provide a sufficient and reasonable sample size. (20)

RESPONSE: Sample size for statistical analysis is based on population size, in this case the total number of wind turbines built in this size category. Since this number is unknown, the Department has determined that it will obtain data gathered from post-construction monitoring of the first 15 wind turbine developments greater than 2,000 square feet but less than 4,000 square feet in size and use this information to evaluate the impacts of these turbines and determine if operations are causing unanticipated levels of direct mortality to birds and bats. If it is determined that unanticipated mortality is occurring, this information would serve to guide the Department in proposing adjustments to the coastal general permit at N.J.A.C. 7:7-7.30 and may be used to curtail turbine operations. Because the Department does not anticipate that significant mortality will result from turbines that meet the criteria of the coastal general permit at N.J.A.C. 7:7-7.30, it believes that data from the first 15 projects constructed will provide sufficient information to assess the effect of these turbines on birds and bats.

191. COMMENT: For pre-construction surveys of wind turbines located on land, the technical manual requires that surveys take place on both the site and a nearby reference site. The Department should explain why a "nearby" reference site is required to be anywhere from three kilometers and no more than 10 kilometers from the proposed turbine site since this distance seems excessive and therefore should be justified. (20)

192. COMMENT: For large scale wind turbine developments, pre- and post-construction surveys are required to be conducted at the project site as well as a reference site. The surveying of a reference site is excessive. Given the large area necessary to construct a large scale wind turbine development and the substantial level of development within the CAFRA zone, the chances of finding a similarly sized referenced site with similar project site features (i.e. similar wind and other natural resources, landscape

characteristics, human disturbances, etc.) within the distance specified will be extremely unlikely. Given the inherent differences between sites, the actual benefit of or conclusions which can be drawn from comparison to such a reference site is not clear. In addition, surveying the reference site will effectively double the cost of the pre and post construction monitoring given the same level of survey effort is required at both the reference and project sites and the survey at both sites will be conducted concurrently. (37)

193. COMMENT: The Department's manual sets precedent in the level of effort required for assessing potential wildlife impacts from wind development. No other states require the applicant to monitor a reference site. The Department requirement assumes that the wind developer will have ready access to a nearby site with similar habitat where radar, sonar and visual surveys can be conducted over a period of three years. While monitoring the reference site may be a scientifically defensible approach, it poses serious logistical and economic burdens upon the wind developer. (49)

RESPONSE TO COMMENTS 191 THROUGH 193: This distance was determined as a means to locate a site suitable as a control. The reference site is one that needs to be close enough to the proposed turbine site to increase the likelihood that conditions on that site are similar to the site where the turbine is proposed to be located, but far enough away from the proposed turbine site to assure that construction activities on the turbine site do not affect avian activity at the reference site. The Department believes that the minimum 3 kilometer distance assures that the sites have enough separation so that activity on the one site will not influence activity on the other site

The Department recognizes that monitoring at a reference site increases the cost of monitoring. However, Before-After Control surveys are recognized in the scientific community as one of the best, most robust survey methods and are particularly important where annual fluctuations are likely, as in bird migrations. The Department's guidance and interpretations regarding the monitoring requirements contained in the Coastal Permit Program rules, N.J.A.C. 7:7 and Coastal Zone Management rules, N.J.A.C. 7:7E are

contained in the Department's Technical Manual for Evaluating the Wildlife Impacts of Wind Turbines Requiring Coastal Permits. In response to comments, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules is developed. As a result of the review, various changes have been made to the technical manual. The Department has made adjustments to the monitoring of a reference site and radar surveys, as described in the response to comments 170 through 174.

The Department is available to assist an applicant in finding a suitable location for a reference site.

194. COMMENT: Breeding bird surveys should be expanded to include surveys as needed for species of conservation concern such as Yellow-crowned Night Heron or Bald Eagle for which the survey methodology as proposed is not suitable. (20)

RESPONSE: The Department disagrees that the breeding bird survey would not pick up species such as those listed above. Although the protocol requires a chickadee alarm call to be played, which is used to encourage songbirds to respond, the Department believes it would be likely that these larger bodied birds would be visually identifiable while the observer is walking the transects. In addition, where the construction of a wind turbine on land in the coastal zone requires a coastal permit, all permittees will have to meet the standards of the existing rule, including those sections that pertain to endangered and threatened species (both of the species listed above fit in this category). Permittees will have to show that they are not in conflict with State endangered species laws, just as any applicant for a CAFRA permit does, separate from the protocols in this document. Further, endangered and threatened species were given extra protection since, for the species that could be affected by wind turbines, many of their important habitat areas are off limits to large scale wind turbines under the Large Scale Wind Turbine Siting Map.

195. COMMENT: The survey protocol for migrating songbirds provides that surveys shall be conducted during the most favorable weather conditions for seeing and hearing birds. There is concern that it is possible to meet the above criteria and completely miss surveying essential migration dates. For example, measurement on a warm dry fall day with five to 10 mile per hour southwest winds would miss migration. The Department should develop more specific criteria consistent with climate conditions and conducive to migration events. (20)

RESPONSE: No survey methodology can control all variables and record the best possible data at all times. However, repeated measurements using the same protocol (and using established methods that others have used to allow for cross-comparisons) will allow the Department to gather statistically significant information, even if it does not always capture the biggest days of migration.

196. COMMENT: The Department should develop more specific criteria for migrating raptor surveys such as the standards developed by the Hawk Migration Association of North America, consistent with climate conditions and conducive to migration events. (20)

RESPONSE: Please note that this is exactly what the Department did – the requirements of the survey (which are listed in the technical manual and can also be referenced on the Hawk Migration Association of North America's website at http://www.hmana) are exactly the same as the ones developed by the Hawk Migration Association of North America. This will allow for cross comparison to data from other regions which will be important in interpreting results of monitoring. For example, this is the methodology that are currently used for the hawk counts in Cape May and Sandy Hook, New Jersey, as well as Hawk Mountain in Pennsylvania.

197. COMMENT: The Department should provide further justification for why the window for the collection of information from radar is shorter than the times for migrant bird surveys. (20)

RESPONSE: The Department selected the time frames cognizant of the high cost of gathering radar data, and attempted to balance the need to gather data with cost of obtaining data. As discussed in response to comments 170 through 174, the Department has changed the technical manual with respect to radar surveys.

198. COMMENT: For post construction monitoring of wind turbines on land, the Department should provide a justification for the dates chosen for carcass searches and why they fail to comport with other date ranges in the technical manual. The Department should justify why the date ranges for carcass removal trials for post- construction monitoring of land-based wind turbines differ from the date ranges of the migrant birds surveys. (20)

RESPONSE: The Department selected these dates as within the range recommended in the literature. The Department expects that the majority of issues relating to mortality will occur during migrations. This informed the selection of the dates. Carcass searches need to be conducted on a more regular basis (since carcasses will be quickly scavenged or decomposed) than migrant bird surveys (which can garner results in fewer visits) hence the different time periods. Carcass searches are a more direct measure of the impact of the turbines. Carcass searches require weather data to be collected, and it is the Department's goal in the future that it will be able to correlate carcass data with weather data to determine if there are patterns related to migration (since we know in which weather conditions birds migrate). This may help answer questions about the timing of collisions (for example, were they related to a foggy night or a major weather front moving through).

199. COMMENT: The protocol for post- construction monitoring of wind turbines located on land for carcass searches provides that if observers are not experienced in identifying bat species the carcass is to be collected and frozen for identification at a later date by a trained professional. As written, this provision could easily be misunderstood to suggest that the bat could be frozen indefinitely. Instead, the provision should state explicitly that a trained professional hired by the applicant must make the identification within 30 days. (20)

RESPONSE: The carcass search data must be included in the final report delivered to the Department. All such reports must be delivered no later than six months after the end of the last post-construction survey period. Thus, the carcass could not be frozen indefinitely. The Department does not see a need for identification to be made within 30 days.

200. COMMENT: The habitat evaluation provisions for wind turbines located in Atlantic Ocean waters should require the applicant to identify shoals and the distance to inlets. (20)

RESPONSE: The habitat evaluation and assessment reports are required to show the location of the site on a NOAA Nautical Chart and to map all shoals.

201. COMMENT: The habitat evaluation requirements for wind turbines located in Atlantic ocean waters should clearly state that the Department's Offshore Ecological Baseline Study is neither intended to be nor should be used as a surrogate for either a habitat evaluation report or impact assessment. (20)

RESPONSE: As stated previously, the technical manual contains the Department's guidance and interpretations regarding the monitoring requirements set forth in the Coastal Permit Program rules, N.J.A.C. 7:7 and Coastal Zone Management rules, N.J.A.C. 7:7E. The technical manual advises applicants to consult the Offshore

Ecological Baseline Study to help guide site selection. The technical manual does not indicate that the study substitutes for site-specific surveys. In response to comments received, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules is developed. As a result of that review, various changes have been made to the technical manual. For the demonstration project, rather than one year of comprehensive survey work prior to the issuance of a coastal permit, targeted surveys will be used along with existing data and scientific literature as detailed in response to comments 165 through 167. Site specific wildlife surveys will not occur prior to issuance of a permit decision, but will occur for one year prior to construction of the project.

202. COMMENT: The habitat evaluation provisions for wind turbines located in non-ocean tidal waters require that the habitat evaluation provide information regarding habitat for species that are not endangered or threatened, including critical wildlife habitat. As it is currently implemented, the critical wildlife habitat rule does not provide adequate protections for waterfowl, shorebirds, colonial waterbirds, migrant landbirds or migrant raptors. Consequently, reference to this requirement fails to provide adequate protection. The Department must propose standards to safeguard these taxa for non-ocean waters. (20)

RESPONSE: Critical wildlife habitats are areas that serve an essential role in maintaining wildlife, particularly in wintering, breeding and migrating. Colonial nesting birds and migratory stopovers are listed in the definition of the term Critical wildlife habitat at N.J.A.C. 7:7E-3.39… Under the Critical wildlife habitat rule, development that would directly or through secondary impacts on the relevant site or in the surrounding region adversely affect critical wildlife habitat is discouraged unless: minimal feasible interference with the habitat is demonstrated; there is no prudent or feasible alternative location for the development; and mitigation measures are taken. The Department

believes that the Critical wildlife habitat rule provides it with a means to consider impacts to these species.

203. COMMENT: With respect to the reporting requirements for wind turbines located in tidal waters, the Department needs to provide more robust impact assessment standards drawn from peer-reviewed literature and the best scientific data. As written, the standards could allow those regulated to conclude from what is known that there will be a minimal impact in the absence of a sufficient basis in the evidence to support such a conclusion. (20)

RESPONSE: The impact assessment standards for tidal waters proposed by the Department contain the same level of detail as the existing "standards for conducting endangered or threatened wildlife or plant species" (N.J.A.C. 7:7E-3C.2). When impact assessments are submitted to the Department they are evaluated on a case-by-case basis. If an applicant does not provide adequate justification for a determination of "minimal impact," the Department will not accept the conclusions of the applicant's impact assessment. Therefore, the burden is on the applicant to justify their conclusions.

204. COMMENT: Based on the level of effort proposed for the pre- and post-construction radar, visual and bat studies, it appears that the Department intends on using the CAFRA permit application process to conduct their own avian and bat surveys using the applicant's funds rather than the Department's funds. These studies will substantially add to the cost of construction of large-scale wind turbines. The Department does not require pre- and post-construction monitoring for the construction of other tall structures that are known to kill birds and bats such as high tension power lines, smokestacks, airports, guy-wire stabilized towers, cell towers, or high rise buildings. It is recommended that the proposed regulations require post-construction radar, visual and bat surveys for the first 15 large scale wind developments. After the first 15 large scale wind turbine developments are completed, any future large scale wind developments would only require post-construction carcass searches and removal trials. By employing

this methodology, the Department would gain valuable knowledge regarding avian and bat impacts from turbines and would reduce the financial burden required to install large scale wind turbines on New Jersey's coastal area. (37)

205. COMMENT: Current research supports the contention that traditional building structures create many more hazards to avian and bat life than wind turbines. If the Department believes it necessary to provide pre- and post-construction monitoring studies for wind turbines, it should promulgate a rule encompassing all development activities in the region. As communication towers, transmission lines, buildings and other human structures have killed millions of birds annually, the Department should insure that future structures of all kinds avoid these kinds of harms in the coastal zone. Additionally, the Department should promulgate buffers as proposed at N.J.A.C. 7:7-7.2(a)12iii for all structures. (34)

RESPONSE: TO COMMENTS 204 AND 205: Only by gathering, analyzing and interpreting data will the Department be able to understand what impact turbines have on New Jersey's coastal environment. The Department appreciates that many other sources can impact bird populations more than wind turbines, partially because these sources outnumber wind turbines in New Jersey's landscape (i.e. the number of buildings or cats versus turbines). While birds may be attracted to and perch on communication towers, for example, there is, at worst, a minimal risk of injury when the bird approaches the tower to perch or alights from the tower. In contrast, when a bird is attracted to perch on a tower associated with a wind turbine, it is put into immediate danger of contact, either in approaching the tower or alighting from it, with the spinning rotor blades. With respect to transmission lines, high tension towers associated with power lines are less than 200 feet in height and do not have the same operational risks as wind turbines. The presence of these structures throughout the landscape highlights the importance of being aware and controlling for impacts from new sources since many of the species populations are already under so much pressure due to other anthropogenic factors

With respect to the cost of monitoring, the Department has made various changes to the technical manual for Tier 4 turbines depending on the number of turbines proposed, as discussed in response to comment 174.

206. COMMENT: For pre-construction visual and audio bird surveys, the Department is requiring a 150 meter separation distance between each survey point regardless of habitat type. This is excessive and not useful in the context of covering relevant habitats. Even at a small site, the number of sampling points could easily approach 100 sample points. Even with increased sample points, the quality of the data will not increase linearly and may overlap adjacent sampling points, skewing the statistical analysis. Instead, the number of sampling points should be determined based on habitat type at the project site and in consultation with the Department. (37)

RESPONSE: The Department disagrees that this is an unreasonable distance and this stance is supported by the literature (please see the studies cited in the technical manual). Although larger (or smaller) distances can be used, the Department believes that 150m is an appropriate distance to capture most individuals at a site. With reference to the number of sampling points required, a site would have to be quite large to garner 100 points (on the scale of 550 acres). Based upon the applications submitted to the Department to date, large areas will not be a frequent scenario. However, the final methodology of each project must be approved by the Department and it will work with applicants to ensure that data is collected in a standardized fashion that will enable the Department to evaluate the impacts of wind turbines constructed along the coast and compare data from different wind turbine developments.

207. COMMENT: The Department's requirement that carcass searches and removal trials be conducted for one year after construction of tier 2 and 3 wind turbines and for two years after construction of tier 4 turbines is supported. These surveys are effective tools for determining avian and bat mortality and will provide the Department with

valuable data which can be used in evaluating the Department's technical manual and Large Scale Wind Turbine Siting Map. (37)

RESPONSE: The Department acknowledges this comment in support of the rule.

208. COMMENT: The technical manual does not appear to have been peer reviewed. If the document has not been peer-reviewed, it should be because there are numerous factual errors and omissions in the document that must be addressed and corrected. There also does not seem to be a specific comment period for the technical manual, although because it is mentioned in the proposal it is subject to comments during the same period. (13, 18)

RESPONSE: Although the Department's technical manual was not subject to outside peer review, it was developed by the Department's bird and bat experts. The draft manual was released at the same time as the proposal to provide potential applicants and the public with a comprehensive package, that is the proposed rule and Department's technical manual setting forth its guidance and interpretations regarding the monitoring required under the proposed rules, thereby affording the public the opportunity to comment on both documents. Based upon the information available, the methods outlined in the technical manual will help guide wind development in the coastal regions of the State. As further information is developed and becomes available, the Department will continue to determine where changes can be made to the rule and technical manual that will both protect the environment and promote renewable energy.

209. COMMENT: The technical manual does not include a statement regarding the goals of the studies proscribed for pre- and post-construction. Scientific reports or paper must provide a statement of goals, a list of hypotheses to be tested, or some other indication as to the purpose of the data collection. Without a statement of goals or hypotheses to be tested, the manual would not pass peer review. (13)

RESPONSE: The technical manual was developed in accordance with N.J.S.A. 13:1D-111 which sets forth the contents of technical manuals issued by the Department. Each technical manual is required to define the procedural and substantive requirements for the completion of an application for a class or category of permit and the review thereof, and is required to clarify Departmental policies and interpretations of any laws, rules and regulations relating to the filing and review of the application. Technical manual are not required to be in peer review format.

210. COMMENT: While the technical manual requires the use of radar for determining numbers of birds and/or bats that fly over a given site, it does not cite a single report that empirically demonstrates that radar can be used to predict the numbers of birds likely to be impacted at wind energy facilities. There have been approximately 50 radar studies at prospective wind power sites; however the Department does not cite any of them. These studies have cost developers and agencies more than $5 million, yet none of the studies has provided a quantitative risk assessment or the analytical approach necessary to use radar data to predict fatality rates at wind energy facilities. In addition, the offshore wind power baseline study commissioned by the Department has failed to provide guidance for using radar data to predict risk to birds in a way that is meaningful for permitting such projects. The scientists conducting the research for the Department have already stated that there are problems with using radar that have not been resolved. The technical manual also fails to enumerate the fact that there are peer-reviewed papers that demonstrate radar data have not been useful for assessing risk to birds or bats at wind energy facilities (Schmaljohann, H.F. Liechti, E. Bachler, T. Steuri, and B.Bruderer. 2008) That paper reported errors in migration passage rates on the order of 400 percent. The Schmaljohann paper was provided to the Department's biologists months prior to release of the technical manual. (13)

RESPONSE: The Department recognizes that radar is an expensive undertaking and that there are mixed reports in the literature regarding its effectiveness predicting risk. Papers such as the one mentioned above do not discount the worth of radar, but rather provide

examples of how to prevent mistakes from the past and make it more effective in the future. Furthermore, radar has been useful in determining the abundance, flight patterns and altitude of birds and bats, as well as showing when avoidance behaviors and barrier effects have occurred. There is no other tested method available, for equal cost, which quantifies nocturnal movements of birds and bats as well. The Department believes that radar has value for illustrating avoidance/barrier effects. However, the costs can be high. As described in response to comments 170 through 174, the Department has refined the technical manual with respect to radar surveys by providing that it will make a case-by-case determination on the need for a radar survey where five or more land-based turbines are proposed based on a case-by-case review of the project, taking into account the number of turbines, the proposed location for the turbines, particularly their proximity to water, wetlands, and nesting and foraging areas, and on-going review of scientific research and literature in terms of use of radar for site assessment.

211. COMMENT: The technical manual suggests that certain groups of birds, for example migrating songbirds, will be vulnerable to collision with turbines. However, there is no reference to the fact that the absolute numbers of fatalities of these birds is relatively small and that significant impacts to these birds have never been reported at wind power facilities in North America. There are now more than 30 post-construction study reports including about 25,000 individual turbine searches during the migrating season. None of these reports state or suggest that impacts to night migrating birds are likely to be significant. (13)

RESPONSE: Data indicates that wind turbines do have potentially significant impacts that vary in severity depending upon a number of factors including the location of the wind turbine. Although the commenter notes that there have been more than 30 post-construction studies reported, as discussed in response to comment 64, few have been in a coastal area. The Atlantic County Utilities Authority site and a site in the Netherlands are coastal wind facilities where impacts to birds have been studied and data is readily available. The importance of taking into account all aspects of the area where wind

turbines are sited, particularly the prevalence and habits of local and migratory bird populations in the area, rather than relying upon results for dissimilar areas, is illustrated by the Altamont Pass wind farm where failure to take into account bird flight paths and behavior resulted in significant impacts and avian deaths. As indicated in the proposal, little of the information available studying the impacts of wind turbines on avian populations provides definitive answers as to the impacts in the coastal zone. Accordingly, the Department believes that a conservative approach to permitting large scale turbines until further information on impacts in the coastal region is developed is the appropriate approach to take to assure unanticipated impacts to the State's natural resources do not occur. The Department believes that this approach is only further supported by information received from the Atlantic County Utilities Authority wind facility in Atlantic City subsequent to proposal of the new rules and amendments being adopted at this time. Available information from the Atlantic City wind facility indicates that impacts in the coastal region are more significant than other areas. The study performed at the Atlantic County Utilities Authority wind facility has revealed higher than national average bird and bat kills. The Department notes that the need to fully consider impacts on the avian populations of the State is only further demonstrated by studies showing that even what were considered to be common species of birds are declining (See National Audubon's State of the Birds Technical Report at http://stateofthebirds.audubon.org/CBID/report.php).

212. COMMENT: The pre and post construction radar surveys include both vertical and horizontal modes. Will the Department require applicants to conduct the radar survey in both horizontal and vertical modes concurrently or will the Department allow an applicant to operate the radar in a horizontal mode for a given period of time and then operate the radar in a vertical mode for the same period? If the radar is required to be operated in the horizontal and vertical modes concurrently, the cost of both the pre- and post-construction radar surveys will effectively double as a minimum of two radar units will be needed to conduct the radar survey. In addition, sophisticated analytical tools

would be required to attribute individual targets to concurrent flight altitude, passage rate, and directionality data that would be captured by the independent systems. (37)

RESPONSE: The Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical manual while assuring that information necessary for the Department to quantify impacts of wind turbines approved under those rules. As a result of that review, the Department has modified its guidance with respect to radar surveys to allow one radar unit to operate 50 percent of the time in horizontal mode and 50 percent of the time in vertical mode, where radar surveys are determined by the Department to be necessary. The radar shall sample in both horizontal and vertical modes to collect information on target density, altitude, direction, and speed. To be cost effective, one radar unit can be used with the unit set 50% of the time in vertical mode and 50% of the time in horizontal mode, changing modes between 6-30 times per hour. Geographical coordinates (latitude, longitude) for the location of each radar unit must be recorded.

213. COMMENT: The technical manual should be revised to differentiate between rural, multi-turbine and urban single turbines when detailing the pre- and post-construction bird and bat monitoring requirements. (46)

RESPONSE: The Department's technical manual does differentiate between multi and single turbine projects. As stated in response to comments 170 through 174, the Department has further modified the technical manual with respect to the pre and post-construction studies for large scale wind turbines (Tier 4) on land. The monitoring at a reference site has been eliminated for wind turbine projects consisting of less than five turbines. Further, in lieu of the radar surveys for large scale wind turbines located on land, when five or more wind turbines are proposed, the Department will conduct a case-by-case review of the project to determine when radar monitoring will be necessary, taking into account the number of turbines, the size of turbines, and the proposed location

for the turbines, particularly their proximity to water, wetlands, and nesting and foraging areas. However, the Department does not agree that monitoring should vary between rural and urban turbines, as birds and bats fly over both rural and urbanized areas and it is important to determine the effects of turbines in a variety of habitat types.

214. COMMENT: The technical manual requires a breeding bird survey be conducted by all applicants. A breeding bird survey is not justified for urban sites with no demonstrated habitat value. (46)

RESPONSE: The Department has gathered enough data to recognize that urban areas can play important roles to breeding birds. Although these areas do not generally have the same species composition as their more rural or undisturbed counterparts, they can still play an important role to individuals of some species. A few examples of species in New Jersey that use urban areas in surprising ways are Peregrine Falcon, Red-headed Woodpecker, Yellow-crowned Night-heron, Red-tailed Hawk, Baltimore Oriole, Cedar Waxwing and Killdeer. Therefore, the Department believes that breeding bird surveys are appropriate and necessary for sites in urban areas as well as non-urban areas.

215. COMMENT: The commenter stated that he is proposing a single wind turbine at the Atlantic City Convention Center site. The requirement for a survey "control" site, no less than three and no more than ten kilometers from the proposed site, could force this urban project to have a control survey performed in a non-urban location, which could result in an invalid and potentially misleading analysis. Further, the three to 10 kilometer spacing requirement precludes the use of the existing Atlantic County Utilities Authority wind farm project experience which has undergone extensive radar surveying performed by the Audubon Society for bird and bat impacts. The Utilities Authority wind project is an excellent control site with respect to his project, but use of it is precluded due to the spacing requirement. The Department should amend the protocol to allow the modification of an applicant's monitoring requirements where radar studies have been completed. (46)

RESPONSE: The Atlantic County Utilities Authority wind farm site would not be an appropriate reference site because there are already turbines at the site. In other words, it is already an impacted site. Nonetheless, as discussed in response to comments 170 through 174, the Department has modified technical manual with respect to monitoring associated with the construction of a single wind turbine by eliminating the monitoring of a reference site.

216. COMMENT: Proposals for the pre- and post construction monitoring of a single wind turbine in an urban setting exceed $500,000. To require this level of analysis and expense for a single turbine application in a previously developed urban location is not financially practical, not scientifically warranted and will act as a clear disincentive for the installation of such sustainable energy programs. (46)

RESPONSE: As noted in response to comments 170 through 174, the technical manual's monitoring protocol for a single large scale turbine has been modified to eliminate radar surveys and the monitoring of a reference site.

217. COMMENT: The cost estimates put forth by the Department in its economic impact analysis for pre- and post- construction monitoring are greatly underestimated. The pre-and post- construction monitoring including three years of comprehensive monitoring at both the proposed site and a reference site for the proposed wind turbines at the Port Authority of New York and New Jersey's Port Jersey facility is estimated to cost two million dollars. These costs must be incorporated into the business plans of developers and investors. If the entry costs are too high and the monitoring requirements excessive, it is likely that developers and investors of onshore wind development will seek other venues where the risk-reward equation is more favorable. (49)

218. COMMENT: The technical manual should be revised to provide a more flexible methodology for monitoring based upon site characteristics, project size and the availability of previously collected data. (46)

RESPONSE TO COMMENTS 217 AND 218: As described in the response to comments 170 through 174, the Department has made various changes to the technical manual. Such changes will reduce costs while providing the information necessary to evaluate the effects of these new facilities. The monitoring requirements of the technical manual for land based turbines vary based on project size. For larger projects, the Department will take into account site characteristics, along with number and size of turbines in determining whether radar monitoring is required.

219. COMMENT: The manual is not a manual in the usual sense. Rather, it is an extension of the studies conducted to date by the Department. To require the additional and ongoing testing in the manner proposed suggests that the regulations themselves are premature. The Department is purporting to endorse and permit these renewable energy sources while the fact is the jury is still out. While the manual is intended to be guidance, it appears that the language in the text will be strictly adhered to, as if it were regulation. (49)

RESPONSE: With this adoption, the Department is attempting to facilitate the construction of wind turbines in appropriate locations, taking into account that there are few studies of land-based wind turbines constructed along the coast and that the level of development allowed at this time must reflect the limitations in available information on potential impacts. However, the Department believes that only through construction and operation of turbines along the coast can the effects be known. Accordingly, the adopted amendments place limits on the larger wind turbines where potential impacts are the greatest and require that monitoring occur to assure that unanticipated levels of impact do not occur in the coastal region. The information gathered though the monitoring required pursuant to N.J.A.C. 7:7-7.30 and 7.31 and N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) will

allow the Department to determine the actual impacts in this environment and will guide the determination of further development of this form of renewable energy in the coastal region. The reservation of the ability to require curtailment of turbine operations during particular periods, if information developed demonstrates that such curtailment is warranted, is a further measure to assure that appropriate protections are in place, again reflecting the need to proceed cautiously in the face of limited information. The data from the Atlantic County Utilities Authority facility has shown that bird and bat mortality in that coastal location is greater than that observed in inland locations around the country. The Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made while assuring that information necessary for the Department to accurately quantify impacts of wind turbines under those rules is developed. As a result of that review, various changes have been made to the technical manual as described in the response to comments 170 through 174.

220. COMMENT: While the Department's technical guidance manual recommends scientifically sound survey methodology to determine the effects of turbines on avian and bat populations, its approach differs greatly from the guidance provided by the United States Fish and Wildlife Service's 2003 interim guidelines to avoid and minimize wildlife impacts of wind turbines. Instead of assessing the potential risks of the project by height of turbines and rotor swept area, as set forth in the Department's manual, the United States Fish and Wildlife Service guidelines recommend using a preliminary risk analysis based on the known ecological risk factors, such as migratory pathways, and available habitat. This preliminary site-specific analysis allows the developer and the resource agency to make informed decisions about the potential risks of a project prior to a full commitment to the project. Many states have adopted this approach to initiate the process of assessing wildlife impacts. Others, such as New York, have prepared guidelines with a similarly tiered structure. In these states, if the decision is made to move forward with the project after the initial assessment, the full scope of the required wildlife studies are determined on a case-by-case basis through consultations with

resource agency personnel. Still other states, such as Delaware, have no formal guidance and will work with the developers to determine the scope of the surveys on a case-by-case basis. New Jersey is the only state that uses the type of turbines to guide wildlife studies. (49)

RESPONSE: The Department's preliminary risk assessment is the Large Scale Wind Turbine Siting Map. The map identifies areas which, based on current wildlife data, are not appropriate for the construction of large-scale wind turbines due to the operational impacts of turbines on birds and bats. Wind turbines located outside of the mapped areas may pose the same operational risk to birds and bats as those identified on the map, In these areas, a determination of the acceptability of wind turbines requires a case-by-case review of site specific information that would be submitted as part of the permit application and a case-by-case review such as the review afforded by the endangered and threatened wildlife and plant species habitat and critical wildlife habitat rules at N.J.A.C. 7:7E-3.38 and 3.39, respectively, as well as review of data gathered through monitoring wind turbines in New Jersey and elsewhere and information from published or unpublished studies or data. As stated previously, pre-construction monitoring is not used to determine acceptability of an application. Pre-construction monitoring will commence prior to construction of a permitted facility and will be used in conjunction with post-construction monitoring to evaluate the impacts of the operation of wind turbines on birds and bats. The "Wind Turbine Guidelines Advisory Committee Recommendations" released by the United States Fish and Wildlife Service in 2003 and sent to the Secretary of the Interior in 2010, is a comprehensive document that is intended to address the entire country. As such, the guidelines need to be broad enough to take into account all landscape types. Where important migratory pathways, such as coastal regions, are present, or endangered or threatened wildlife species habitat is present, the guidelines recommend more intensive monitoring, mitigation or, in some cases, that the site not be developed. If the federal recommendations were used to guide decision making in New Jersey, they would immediately identify the coastal region as a critical location for wildlife. Since the Department is already aware of the importance of the

coastal habitat, it determined it is more appropriate to establish its monitoring requirements in a tiered manner based on the size of the turbine rather than just the proposed location.

221. COMMENT: The technical manual would have benefited from broader review. At the very least, an opportunity to comment on the manual would have given greater confidence to the regulated community that the Department is taking open, objective, and scientific approach in promulgating the proposed regulations. (49)

RESPONSE: The technical manual was released for comment on September 8, 2009 in conjunction with publication of the rule proposal. Numerous comments were made on the technical manual, which are summarized and responded to in this adoption. (See comments 185 through 232) In response to these comments, the Department has reviewed the monitoring that wind facilities would be required to conduct to comply with N.J.A.C. 7:7E-7:7E-7.4(r)1vii(4) and viii(3) to determine if adjustments could be made to the technical while assuring that information necessary for the Department to accurately quantify impacts of wind turbines approved under those rules is developed. As a result of that review, various changes have been made to the technical manual, which is available at http://www.state.nj.us/dep/landuse/windturbine.html.

222. COMMENT: Radar data should complement on-site visual observations conducted by expert ornithologists. Visual observations may be aided by cameras and binoculars with a reticular pattern to quantify distance and altitude of birds (Forsell, pers com. 2003). Data should be collected year-round to document spring and fall migration, over-wintering, and movements from nest to roost sites and foraging areas for any avian species utilizing a proposed development area. (35)

RESPONSE: As discussed in response to comments 170 through 174, the Department has modified its guidance with respect to radar surveys. The Department will determine on a case-by-case basis when radar surveys are needed in consideration of several factors.

Where the Department determines radar surveys are necessary, it expects that most radar studies will have a ground truthing component and if they do not, the Department will require that this be inserted during the methodology review that will be conducted. The Department's pre- and post- construction monitoring has multiple components that will capture the most important observations of each season and group of species.

223. COMMENT: Due to the potential to impact migratory bats, it is recommended that monitoring of bat use be conducted at all proposed wind project sites. Although bat mortality associated with wind turbines appears to be highest in forested areas and lowest in open areas (prairies, fields) (Johnson, 2005) bat mortality was also documented at the Atlantic County Utilities Authority wind farm in Atlantic City. (35)

RESPONSE: The Department agrees that bats are affected by wind turbines and therefore the coastal general permits at N.J.A.C. 7:7-7.30(a)8 (first 15 projects) and 7.31(a)9 require carcass searches and the Coastal Zone Management rules at N.J.A.C. 7:7E-7.4(r)1vii(4) and viii(3) require migratory bat surveys as part of the monitoring requirements for large-scale turbines.

224. COMMENT: Thermal imagery picks up heat from the birds' bodies. The bird appears on the screen as a series of dots moving in a given direction. The species of birds may also be determined by characteristic wing beat signatures as open wings of birds translate to brighter light on the screen. Coupled with fixed vertical beam radar (X-band), thermal imagery helps determine species, altitude, speed, number, and direction of flying birds. Thermal imagery captures a cross section of the sky and detects birds close to the ground; the radar's field is only 4 degrees, with a minimum altitude of 150 feet. Fixed vertical beam radar provides data on flight altitude and size of bird. The combined technology is reliable up to an altitude of 6,000 feet. It is recommended that thermal imagery be included in the monitoring protocols for bird and bat use of proposed wind turbine sites. (35)

RESPONSE: The Department agrees that thermal imaging provides a useful solution to quantifying bird use in an area, but the costs appear to be prohibitive at this time. The Department's pre- and post-construction monitoring has multiple components that will capture the most important observations of each season and group of species. However, the Department would also encourage any applicants to voluntarily include this type of monitoring in their surveys.

225. COMMENT: Horizontal S-band radar detects the range and flight direction of birds. The S-band radar assures target detection in adverse weather where X-band radars are heavily affected by rain clutter. It is recommended that both X-band and S-band radars be included in the monitoring requirements. (35)

RESPONSE: Where the Department finds radar surveys are necessary, it will only require X-band radar. There has been an effort by radar experts to deal with the rain clutter problem by implementing the use of various filters and the Department believes those will be sufficient to address this issue.

226. COMMENT: A pre-construction acoustic station may be established for monitoring night flight calls of migrating birds. A simple microphone system may be built to help tune in and amplify bird migration call notes for documenting the quantity of calling birds and species composition over a specific location. Once the latter system is functional, it can be integrated into networks of recording stations to help produce a larger picture of bird migration and log data on regional bird migration patterns. Long-term monitoring may provide a unique index for documenting the presence and changes in bird populations over time. (35)

RESPONSE: The Department recognizes that monitoring nocturnal bird flight calls is a valid method of determining species composition and numbers of individuals moving through an area. However, analyzing the data is a highly specialized task and would take a very skilled observer. In addition, this type of monitoring relies on every (or at least a

majority of) individual(s) calling within the range of the recording devices. The data is species specific, but probably not as comprehensive as data that radar can collect. However, as this method is refined and becomes more widespread and the number of individuals qualified to interpret the data increases the Department would consider incorporating it into the monitoring protocols.

227. COMMENT: With respect to migrating raptors, the references to Howe et al. (2002) and Kerns and Kerlinger (2004) are grossly misrepresented. The technical manual states that migrating raptors are one of the most susceptible bird groups to direct impacts (collisions) of turbines, yet during two years of study by Howe et al no raptors were reported killed. Regarding the Kerns and Kerlinger (2004) report, only one raptor, a Red-tailed hawk, was reported to be killed by wind turbines. Further, the cited Allen and Peterson report (1936) states that the coast of New Jersey is a known migratory pathway for raptors yet their only dataset comes from a location in Cape May below the canal. No empirical study exists definitively demonstrating that the coast of New Jersey is a migratory pathway for raptors. In addition, no empirical study has ever demonstrated that wind turbines have significantly impacted migrating raptors. (13, 18)

228. COMMENT: The Department has failed to note one of the most important references regarding fatalities of raptors at wind energy facilities: deLucas, M, G.F.E. Janss, D.P. Whitfield, and M. Ferrer. Collision fatalities of raptors in wind farms do not depend on raptor abundance. Journal of Applied Ecology 45:1695-1703. This report demonstrates that raptors do not collide with wind turbines in significant numbers even in locations where there are tens of thousands of migrants passing through a wind energy facility consisting of hundreds of turbines. This report also has implications for the wind turbine siting map report, also produced by the Department in September 2009. (13)

RESPONSE TO COMMENTS 227 AND 228: The Department has removed reference to Howe 2002, and Kerns and Kerlinger 2004 from the Large Scale Wind Turbine Siting Map Report as they were mistakenly cited there. As listed in the text immediately

following the Allen 1936 citation, the New Jersey Audubon Society has conducted hawk counts in Cape May (on the southern most coast in New Jersey) and Gateway National Recreation Area – Sandy Hook Unit (on the northern-most coast of the barrier island chain in New Jersey) for many years and that data provides empirical evidence that the coastline of New Jersey is a migratory pathway for raptors. In fact, Cape May is heralded as "the raptor capital of North America" (by American Birds magazine, New Jersey Audubon Society, multiple travel guides and birding texts). The whole coast of New Jersey is also considered part of the Atlantic Coast Flyway and migrating raptors are part of the suite of species using this flyway. DeLucas et al do note that raptors are the most impacted of the large bodied birds. While the DeLucas et al paper does state that abundance of birds does not necessarily translate into proportion of collisions, the study area in this paper was mountainous regions of Spain and the results may not translate to coastal regions. Evidence that the results in New Jersey may not follow those in mountainous regions in Spain include the fact that the Atlantic County Utilities Authority site documented 4 raptor kills in one year for a relatively small installation (5 turbines). This is higher than average compared to other sites where carcass studies have taken place.

229. COMMENT: The technical manual states "The potential impact…on migrating shorebirds is not well understood." The manual needs to clearly state that the reason for this is that there have been very few shorebirds killed at wind facilities across the United States. Even at the Atlantic County Utilities Authority wind farm where environmental organizations and agencies expressed a high level of concern for these birds, there were almost no fatalities in two years of study. In three migration seasons at the Atlantic County Utilities Authority site, only two shorebirds were killed and one of those two was an American Woodcock. For perspective regarding these fatalities, the Department permits an annual harvest of about 1,800 $\pm$ 900 woodcock annually and the United States Fish and Wildlife Service permits about 300,000 to be shot each year in the United States. It has not been demonstrated that shorebirds are at risk from wind turbines, despite significant research effort to monitor such impacts. (13, 18)

RESPONSE: The Department stands by its assertion that implications for shorebirds are not well understood – and this includes barrier and avoidance effects as well as collisions. Many of the wind turbine installations that exist in the United States are not in areas where shorebirds occur in high densities, or at all, so it is not surprising that very few have been shown to be susceptible to collisions. As far as Atlantic County Utilities Authority is concerned, it should be noted that the smaller the species, the more difficult it is to detect and perhaps the more likely it is to be quickly scavenged. The results of carcass searches can be biased due to the removal of carcasses by scavengers before they can be counted as well as observer bias/error (Johnson, G.D., W.P. Erickson, M.D. Strickland, M.F. Shepherd, D.A. Shepherd. 2003. Mortality of bats at a large-scale wind power development at Buffalo Ridge, Minnesota. The American Midland Naturalist 150(2):332-342). In order to better estimate the actual numbers of fatalities, carcass removal trials to assess the impacts of scavengers and searcher efficiency trials to correct for observer bias are needed. Accordingly, the raw number of "2 shorebirds" is misleading. Instead, the corrected estimates give a better picture of impacts to shorebirds from the Atlantic County Utilities Authority wind facility. Those numbers indicate impacts much higher than reported at other wind farms in the United States. The Department believes that it is too early to determine what the impacts on shorebirds will be from large scale wind turbines in the coastal area. Considering the enormous importance of the New Jersey coast as a nesting and migratory stopover location for a number of shorebird species, the Department will continue to take a conservative approach until there is enough data to justify acting otherwise.

230. COMMENT: The section of the manual addressing pre-construction wintering bird surveys references the Goodale and Divoll study (2009) which has not been peer reviewed. If the Department is concerned about impacts to waterfowl, a broad review of the literature is needed. There are numerous studies of wind turbines in various flyways across the United States that show very few impacts to waterfowl. For example, the Department is referred to research conducted at the 89 turbine Top of Iowa wind energy

facility which is surrounded by wildlife management areas. At that site, Iowa Department of Natural Resources and Iowa State University biologists conducted a two year post-construction study of the habitat avoidance of waterfowl at the turbines and showed no significant impacts. No ducks or geese were found dead during the two year study. Instead of citing research that has not been peer reviewed and is incomplete, the Department should undertake a thorough review of the empirical literature on bird impacts from wind turbines. Such review would show that many of the assumptions and assertions of the technical manual are erroneous. (13, 18)

RESPONSE: The Goodale and Divoll paper is not a study, but rather a literature review. Given the lack of information for impacts of wind turbines in coastal regions, the Department felt it was justified in citing a non-peer reviewed literature review because it represented an excellent compilation of available data. As part of its efforts to judiciously assess the impacts of wind turbines on waterfowl, the Department believes applicability of the data from inland sites to coastal sites is limited. The Department's belief that data from different types of areas are not necessarily appropriate to predict impacts in the coastal area has already been demonstrated to be correct since the corrected estimates of collisions that have occurred at Atlantic County Utilities Authority far outnumber the reports of average fatalities from other locations in the United States, many of which are located inland.

231. COMMENT: The technical manual fails to provide analytical tools for using pre-construction data collected to predict or assess risk. The manual does not provide details or citations regarding how the data can be used to predict or assess risk in a manner that will assist in the permitting process. Without such analytical tools, pre-construction data are not useful for permitting wind power projects. (13)

RESPONSE: The purpose of the technical manual was only to instruct applicants how to collect pre- and post-construction data. Pre-construction data is not intended to serve as a means to predict risk. The data gathered through the pre-construction monitoring serves

as a baseline against which the post-construction monitoring will be compared. This comparison will provide the Department with information that will better quantify impacts.

232. COMMENT: In the discussion of the post-construction impact studies, the technical manual does not provide a clear set of goals for those studies. Is the goal to determine how many birds or raptors have been killed? The goals or objectives of the post-construction studies need clarity. The references to the NEXRAD and a "migration event" are undefined. What constitutes a "migration event?"

A means of interpreting the numbers of dead birds, in terms of biological significance, is necessary. Without a statement regarding what constitutes biologically significant impacts, post-construction monitoring is meaningless. Department biologists use biological significance in developing hunting quotas. In fact, DEP biologists permit the hunting of species that are declining or, in some cases, species of concern in adjacent states. (13)

RESPONSE: The goal of the pre- and post construction monitoring is to quantify impacts of wind turbines. The potential impacts from wind turbines are not limited to deaths occurring as the result of collisions. Many of the surveys aim to determine if there are indirect impacts such as avoidance and barrier effects. The carcass study will seek to determine what the direct impacts from collisions are. Once these various impacts are understood, biologists can begin to determine how "biologically significant" impacts will be defined. It is impossible to set these types of standards at this time, with the limited amount of data that is currently available and the complex analysis that will involve. However, despite these obstacles, the Department remains committed to encouraging green energy in the coastal zone in a responsible manner.

Measures to minimize bird mortality at wind farms in coastal areas

233. COMMENT: To minimize bird mortality associated with wind turbines, Kerlinger and Hatch (2001) recommends wind turbine towers be tubular or monopole instead of lattice design to prevent birds from perching and to minimize other possible perching areas such as platforms and landing areas. Therefore, all wind turbines should be constructed using a tubular or monopole tower. (35)

RESPONSE: The rules set a limit on the height of lattice towers. The proposal established that height at 100 feet. However, as discussed in response to comments 111 and 112, the height of lattice towers has been changed on adoption to 120 feet. The Department does not anticipate that changing the height of lattice towers from 100 feet to 120 feet would result in a significant effect on birds and bats.

234. COMMENT: Painting blades, appropriate spacing between towers and other industry techniques may help reduce avian mortality to acceptable levels. (11)

235. COMMENT: Towers and rotors may be painted a neutral color to minimize visual effects. However, Söker et al (2000) recommended bright, light colors to make the structures more visible to birds. McIssac (2002) reported that rotor blades painted white with or without two vertical black bands were most conspicuous to raptors. Another way to enhance visibility is to subdivide each white blade into six parts: the first blade is painted black in areas 1 and 4; the second blade is painted black in areas 2 and 5; while the third is painted black in areas 3 and 6 (Hodos, 2003). Further, painting the three blades black is a technique for increasing visibility (Hodos, 2003); such preliminary research was conducted on kestrels only and the applicability to other species untested. It is recommended that any of the aforementioned color schemes be used to minimize impacts to avian species utilizing the project area. (35)

RESPONSE TO COMMENTS 234 AND 235: The Department will consider such measures in evaluating specific wind energy facilities under the Coastal Zone Management rules.

236. COMMENT: Typically wind turbines have two or three rotors, the latter configuration being more common. Söker et al (2000) reported that rotor speeds are optimized to reduce noise emissions and increase aerodynamic efficiency, resulting in reduced drive train, gearboxes, tower-top masses, and blade size. Kerlinger and Hatch (2001) reported that large rotors, rotating at low (20-24) rotations per minute are less fatal to birds than smaller and faster-rotating rotors, a conclusion that was also reached by Söker et al (2000). Söker et al (2000) also reported that turbine models are available with rotor speeds between nine and 21 rotations per minute. More recently, a vertical axis wind turbine was developed that implemented omni-directional rotor technology, minimizing rotor span. The Department should encourage implementation of a large rotor design, rotating between nine and 24 rotations per minute for traditional wind turbines greater than 199 feet in height. Alternative wind turbine designs such as vertical axis turbines should also be investigated. (35)

RESPONSE: Although larger wind turbines have a slower rotational speed, the speed of the blades at the tip is high. The blade speed coupled with the larger rotor swept area poses a potential risk to birds and raptors are particularly susceptible. Currently there are no commercially available vertical axis turbines.

237. COMMENT: The rules fail to consider the advances that have been made in mitigation. (44)

RESPONSE: The rules include a curtailment provision which minimizes the impacts of the operation of wind turbines on birds and bats. The Department will consider potential mitigation measures such as painting of blades, spacing of turbines and other mitigation measures developed worldwide as further information becomes available on the effectiveness of these measures.

238. COMMENT: Procedures to eliminate or reduce the chance of harm to wildlife especially during peak migration periods are supported. (34)

RESPONSE: The Department acknowledges this comment in support of the rule.

239. COMMENT: Mitigation measures should be instituted for all structures that pose a risk to avian and bat species, not just wind turbines. (34)

RESPONSE: The Department does require mitigation for structures that pose a risk to birds and bats on a case-by-case basis. For example, under the Endangered or threatened wildlife or plant species habitat rule, N.J.A.C. 7:7E-3.38, if construction or development of a site is likely to impact Osprey, a threatened species, new nesting platforms may be required to be built. Likewise, if a threatened species such as a pine snake would be impacted, creation or enhancement habitat onsite or at a nearby location may be required. However, this rule is specifically intended to address impacts from wind turbines since they are a new use in New Jersey's coastal zone.

240. COMMENT: Present and future mitigation solutions may substantially reduce or eliminate the risk of wind turbines to wildlife. It seems important that the regulations provide exceptions to the restrictions (for example, limits on lattice towers, larger turbines and more turbines) if the applicant can show that mitigation techniques reduce avian risk to an acceptable level or eliminate the risk all together.

The best solution for the environment and public good is one that permits renewable energy without unacceptable risks to the environment. While today solutions may or may not exist to protect avian wildlife from wind turbines, solutions may exist in the future to enable turbines to co-exist and enhance the environment. By providing mitigation exceptions, the Department would be encouraging the industry to develop solutions that would enable wildlife and wind turbines to co-exist. For this reason, the regulations would be better if they included mitigation exceptions and defined an acceptable avian fatality risk. (7)

RESPONSE: It has been documented that lattice towers are associated with higher bird mortality as the lattice work provides a perching area for birds, which may then fly into the rotating blades and be killed. Therefore, the Department does not believe that mitigation is appropriate, and monopoles are required for taller turbines. With respect to larger turbines and more turbines, the size and number are used to determine whether the project is a reviewed under a general or an individual permit application as well as to identify those locations where the Department has data to make the determination that wind turbines are unacceptable due to the operational impacts on bats and birds and therefore, mitigation is inappropriate.

CHAPTER 7

COASTAL PERMIT PROGRAM RULES

N.J.A.C. 7:7-2.1 Activities for which a CAFRA permit is required

241. COMMENT: N.J.A.C. 7:7-2.1(b)13 and 2.3(d)4 provide that the construction of a wind turbine on or structurally attached to an existing building does not require a CAFRA or Waterfront Development permit provided the wind turbine is less than 200 feet in height, has a cumulative rotor swept area of 2,000 square feet or less and any portion of the tower of the turbine more than 100 feet above the ground surface is a free standing monopole. The standards of the above cited provisions are confusing. It is not clear what "structurally attached" means. This coupled with the height restrictions raises many questions. Does this provision restrict wind turbines on roof-tops of buildings more than 200 feet in height? Does it suggest putting monopole towers on roof-tops no more than 200 feet in height provided they are structurally attached?

Wind turbines should not be structurally attached to an existing building because existing buildings or other structures were not designed, engineered or built to withstand the stress, weight, movement and vibration associated with the installation and operation of a wind turbine. If the electrical wiring for a turbine and tower installed away from the

building qualifies as "structurally attached" then the "structurally attached" language should be removed from these provisions. To suggest that a wind turbine be "structurally attached" to a building to qualify for a Permit-by-Rule is to mandate an unsafe wind turbine and tower installation. (11)

242. COMMENT: The concept that wind turbines have to be attached to an existing building to not require a coastal permit is opposed. In many instances it may be inappropriate to attach the monopole to an existing structure. Whether the monopole is attached or not, does not change any impacts that monopoles may have on the environment. (34)

RESPONSE TO COMMENTS 241 AND 242: The Department is not advocating the placement of monopole wind turbines on rooftops, nor addressing the feasibility or advisability of rooftop turbines. However, the Department has received requests for information regarding the placement of small wind turbines on rooftops and therefore included a provision addressing such.

N.J.A.C. 7:7-2.1(b)13 and 2.3(d)4 do restrict wind turbines on buildings more than 200 feet in height because the total height of the building and turbine cannot exceed 200 feet in accordance with N.J.A.C. 7:7-2.1(b)13i(2) and 2.3(d)4ii. These are the same overall height limitations and rotor swept area limitations as turbines that qualify for the permit-by-rule at N.J.A.C. 7:7-7.2(a)12, and thus the potential operational impacts to the environment, including wildlife, are similar, as discussed in response to comment 253. However, on the ground impacts would be less as the wind turbine would be on or attached to an existing building.

243. COMMENT: The amendments at N.J.A.C. 7:7-2.1(b)13ii provide that a CAFRA permit is not required for the installation of solar panels on or structurally attached to an existing building; on a utility pole in a maintained utility right-of-way; on legally existing impervious cover outside of a floodway; or on a sanitary landfill. This exemption should be expanded to include solar powered street and parking lot lights. (37)

RESPONSE: The Department intended that solar panels on any utility pole, including electric, telephone, cable and lighting poles would not require a CAFRA or Waterfront Development permit and is amending N.J.A.C. 7:7-2.1(b)13ii and 2.3(d)5ii for the purpose of clarity. Further, the Department agrees parking lot light poles, although not necessarily located in a maintained utility right-of-way, are comparable to the utility poles identified and the installation of solar panels on or structurally attached to parking lot light poles similarly have minor to no impacts. Therefore, the Department is amending the rule on adoption to provide that solar panels installed on or structurally attached to a parking lot light pole do not require a CAFRA or Waterfront Development permit.

244. COMMENT: Does the exemption for the installation of solar panels on utility poles located in a maintained right-of-way allow for a change in height of the structure? The utility pole and the solar panel should not exceed 200 feet in height because new intrusive lighting required by the Federal Aviation Administration would be required. (24)

RESPONSE: The need to obtain a Department permit and any conditions that might be applicable to such a Department permit would not impact any independent permitting requirement applicable to the project by the Federal Aviation Administration or other agency.

245. COMMENT: Proposed N.J.A.C. 7:7-2.1(b)13ii and 2.3(d)5iv do not require a CAFRA or waterfront development permit for the installation of solar panels on sanitary landfills provided the solar panels are included in the Closure and Post-Closure Care Plan or modified plan as approved by the Department in accordance with N.J.A.C. 7:26. Solar panels should not be permitted to be installed until final cover has been put in place. (24)

RESPONSE: The Closure and Post-Closure Care Plan or modified plan, as approved by the Department prior to implementation, will address the type and timing of the final cover, as well as the installation of the solar panels.

246. COMMENT: N.J.A.C. 7:7-2.1(b)13ii and 2.3(d)5 which provide that a CAFRA or Waterfront Development permit is not required for the installation of solar panels on or structurally attached to an existing building, on a utility pole in a maintained utility right-of-way, on legally existing impervious cover outside of a floodway, or on a sanitary landfill is supported. (23, 34)

RESPONSE: The Department acknowledges this comment in support of the rule.

247. COMMENT: The Department should explain how solar panels increase impervious cover as there is space between the panels which will allow rain to filter into the ground. (34)

248. COMMENT: The Department should not consider solar panels impervious cover. (3, 42)

RESPONSE TO COMMENTS 247 AND 248: The rule amendments do not address whether solar panels are considered impervious cover. The amendments provide that a CAFRA or Waterfront development permit is not required for the construction of solar panels on legally existing impervious cover except when located in a floodway. The Department notes that on April 23, 2010, Governor Christie signed legislation that amends laws including the Waterfront Development Law and CAFRA to provide that solar panels are not considered impervious cover, although the foundations of a solar panel would be considered impervious cover. (See P.L. 2010, c.004)

249. COMMENT: The provision at N.J.A.C. 7:7-2.1(b)13i and 2.3(d)4 which requires the wind turbine(s) to have a cumulative rotor swept area of 2,000 square feet would

preclude the construction of more than two turbines at a site. For example, the turbines at the Atlantic County Utilities Authority would violate this provision. In order to have three turbines, each turbine must be small and generate minimum energy. This requirement prohibits anything but small residential turbines in most multiple turbine scenarios. In addition, the height limitations unduly restrict the installation of renewable energy facilities without any real environmental protections. (34)

RESPONSE: The referenced rules address turbines on or structurally attached to an existing building. The rules do not prohibit wind turbines with a cumulative rotor swept area of 2,000 feet or more. Instead they provide that turbines of this size do not qualify for the permit by rule, but must undergo Department review as a result of the increased potential for significant impacts to the environment with increased size. It is highly unlikely that more than one wind turbine would be on or attached to a building. Other wind turbines are addressed by either the general permits or individual permits, with turbines such as those at the Atlantic County Utilities Authority site warranting review as an individual permit application.

250. COMMENT: The Department is urged to expand the exclusions at N.J.A.C. 7:7-2.1(b)13ii and 2.3(d)5 to include the installation of solar panels on any site that is not being maintained in its original natural state. Specifically, N.J.A.C. 7:7-2.1(b)13ii and 2.3(d)5 should be revised to include the installation of solar panels on a brownfield site as defined at N.J.S.A. 58:10B-23.d and on any lawn or landscaped area provided that no more than five percent of the designated development area is utilized for impervious system components such as piers or equipment pads but excluding the solar panels themselves and all other disturbed areas of the site are restored to their pre-disturbed condition.

These revisions are appropriate as the Department has interpreted the statutory intent to “exclude developments with relatively minor impacts.” Legislation is currently pending which would exclude solar panels from designation as an impervious surface and would reinforce the fact that these systems have “minor impacts.” In addition, N.J.A.C.

7:7-2.1(b) provides precedent for the exclusion of certain activities from regulated development "provided that all disturbed areas are restored to pre-disturbed conditions. The nature of ground-mounted systems specifically allows for such restoration." (23)

251. COMMENT: A coastal permit should not be required for the installation of solar panels in stormwater management areas and in existing dry sand mines. (3)

RESPONSE TO COMMENTS 250 AND 251: The solar panels that the Department determined in the adopted rules do not require permit review are limited to those areas that are unlikely to be environmentally sensitive or have complicating circumstances that require regulatory evaluation. Solar panels installed on brownfields or sand mines, for example, may need to be evaluated by the Department for the presence of endangered or threatened species habitat or require remediation or may involve disturbance to contaminated areas. In the case of stormwater management facilities, the project will need to be evaluated to ensure that the facility will continue to function properly as a stormwater management facility.

As noted in response to comments 247 and 248, on April 23, 2010, Governor Christie signed legislation (P.L. 2010, c.4) that amended the Waterfront Development Law and CAFRA to provide that solar panels are not considered impervious cover, although the foundations of a solar panel would be considered impervious cover. The amendments recently signed into law did not designate solar panels as "minor impacts" but rather provided that they not be calculated as impervious surface. The Department believes the legislative amendment provides an appropriate accommodation. As such, the Department will continue to regulate solar panels in these areas.

N.J.A.C. 7:7-4.2 Application contents

252. COMMENT: The proposed amendment to N.J.A.C. 7:7-4.2 requiring submission of the proposed monitoring methodology for wind turbines that require pre- and/or post-

construction monitoring is not supported. This requirement should apply to all applications, not just wind energy facilities. (34)

RESPONSE: Only by gathering, analyzing and interpreting data will the Department be able to understand what impact turbines have on New Jersey's coastal environment. The Department appreciates that many other sources can impact bird populations more than wind turbines, partially because these sources outnumber wind turbines in New Jersey's landscape (i.e. the number of buildings or cats versus turbines). Although other sources of risk exist, that does not mean the Department should not monitor this source and minimize risk to the best of its abilities. The pre- and/or post construction monitoring of wind turbines is being required to enable the Department to evaluate the impacts of large scale turbines and determine the extent to which operations are affecting the behavior and distribution of birds and bats and, in tidal waters marine organisms.

N.J.A.C. 7:7-7.2 Permits-By-Rule

253. COMMENT: The Department should provide a specific explanation of the studies, data or principles that informed the determinations of the number of turbines that can be built and the total possible rotor swept area under the permit-by-rule. (20)

RESPONSE: The standards of the permit-by-rule were intended to address small scale residential wind turbines. As stated in response to comment 109, the rotor swept area limitations were selected taking into account the potential for impact, the specifications of small scale wind turbines that are available, as well as to relieve the regulatory burden for smaller wind turbines. The greater the rotor swept area, the greater the area for birds and bats to be impacted by the turbines. The height limit was determined by considering the height at which birds are migrating and moving. Further, as the number of turbines increases so does the potential for impact. Literature cited in the proposal summary shows that the greater the size of the turbine, the greater the potential for impacting birds and bats. As stated previously, with the exception of the utility scale project at the

Atlantic County Utilities Authority site in Atlantic City, all of the 24 wind turbines constructed under the New Jersey Clean Energy Program for which the Department was able to obtain data meet the height and rotor swept area requirements of the permit-by-rule as adopted.

254. COMMENT: In general, only accessory electrical generating structures should be permitted in Pinelands Forest Areas, not new principal uses. The rule notes that three wind turbines generate approximately 50 kilowatts. Literature indicates that a single family home needs between 5 and 15 kilowatts. The 50 kilowatts permitted under the permit-by-rule is three times the amount that a home or small business would need. Therefore, three wind turbines seems excessive and not to be an accessory development. (24)

RESPONSE: A 50 kilowatt wind turbine would not be excessive for a small business. The number of turbines allowed to be constructed under the permit-by-rule at a site is limited in height, rotor swept area and number at a given site to address the potential impact of wind turbines on birds and bats.

255. COMMENT: In response to the December 11, 2008 stakeholder meeting, the Department changed the height requirement for wind turbines subject to the permit-by-rule from 150 feet to 200 feet in height. This change is both appropriate and greatly appreciated. (11, 14)

RESPONSE: The Department acknowledges this comment in support of the rule.

256. COMMENT: The summary of the proposed permit-by-rule for the construction of wind turbines states that the Department anticipates that the size limitations of the permit-by-rule will allow the construction of most 50 KW and smaller turbines, the power rating typically used for small businesses. The permit-by-rule should be modified to increase the rotor swept area from 2,000 to 4,000 square feet to allow the construction of 100 KW

sized turbines. A 100 KW turbine will accommodate most small businesses. To cap the permit-by-rule at 50 KW wind turbines will severely limit the ability of many of New Jersey's small businesses and small municipalities to utilize the permit-by-rule. This would be an unfortunate result of an attempt to expedite permitting of wind turbines. (11, 14)

257. COMMENT: The permit-by-rule regulations conflict with the intent of the rule. The three turbine maximum coupled with the 2,000 square feet rotor swept area requirement significantly limits the amount of energy that can be derived from wind even for small businesses. According to the proposal, the intent of the regulations is to provide sufficient energy capacity for small businesses. There are few, if any, wind manufacturers today that can produce three wind turbines with a rotor swept area under 2,000 square feet having a 50 kilowatt capacity. Furthermore, turbine capacity is rated when the wind is at optimal speed. Turbines do not run at optimal speeds 24 hours a day. No turbine operates at 100 percent, so the actual energy generated will be less than 50 kilowatts per hour, which may be insufficient to power a small business, as the Department stated was its intention with these regulations. It is recommended that the Department consider raising the maximum size of swept area to 4,000 square feet to accommodate the actual size of wind turbines and rated capacity. (7)

RESPONSE TO COMMENTS 256 AND 257: The general permits are not capped based on the power rating of the proposed wind turbine, but rather the dimensions of the turbine. The wind turbines identified by the commenter would be subject to a coastal general permit with its abbreviated application and review process as discussed previously. While general permits do require application to the Department for approval, the Department believes the expedited process provided under the general permit will assist businesses and municipalities that need the size turbine described by the commenters while assuring that the Department is able to provide the appropriate oversight for these moderate sized turbines.

The Department looked at a number of different wind turbine models and there are a number of models that are both above and below the selected thresholds. With the exception of the utility scale project at the Atlantic County Utilities Authority site in Atlantic City, all of the 24 wind turbines constructed under the New Jersey Clean Energy Program for which the Department was able to obtain data meet the height and rotor swept area requirements of the permit-by-rule or coastal general permit.

258. COMMENT: Limiting solar and wind installations to within 120 feet of an existing structure on already disturbed land is arbitrary and will impede renewable energy. Solar panels are not impervious and should be allowed on fields and farms and, in many cases, further away from existing buildings. This rule does nothing but stop the construction of solar arrays. Taking into consideration the setbacks that towns require, the ability to install solar panels on land may be severely limited. This rule also dramatically limits how much solar can be put on a piece of property. (44)

RESPONSE: The adopted amendments and new rules do not place such a limitation. The 120-foot limitation only restricts the applicability of the permit-by-rule in endangered or threatened wildlife or plant species habitats.

259. COMMENT: The requirement that wind turbines be located within 120 feet of an existing building at N.J.A.C. 7:7-7.2(a)12iv(1) is unreasonable. This distance should be increased to 300 feet. (9)

RESPONSE: As indicated in response to comments 111 and 112, the 120-foot limitation is only applicable to the permit-by-rule in endangered or threatened wildlife or plant species habitats. In order to prevent development that would have adverse on-the-ground effects on endangered and threatened wildlife species habitat, the permit-by-rule requires the wind turbines not be located in an area mapped as threatened and endangered wildlife habitat on the Department’s Landscape Maps, unless the wind turbine is located within 120 feet of an existing building on actively maintained lawn or areas of land that have

been manipulated through landscaping and continue to be so maintained or the wind turbine is located on existing impervious cover. In these situations the Department has determined that, regardless of the area being included within the mapped habitat area any adverse modification of habitat through site disturbance would be minimal given the scale of the development, its proximity to existing structures and the pre-existing ongoing disturbance in close proximity to the building. As the distance from existing development increases, the likelihood that threatened and endangered species will use the area for foraging or other activities increases thus warranting a site-specific review by the Department which is not afforded under the permit-by-rule. .

260. COMMENT: By mandating that the rotor swept area of the turbine be no more than 2,000 square feet under the permit-by-rule, wind installations will be kept to two very small 20 KW wind turbines. Such small turbines could provide electricity for a single family home and would not be worth the installation, especially considering the cost of environmental studies. The proposed rules would limit the number of turbines permitted at a given location to three, which is not realistic. The number of turbines allowed at a site should be five with a cumulative rotor swept area of 8,000 square feet. Under the proposal, the very successful Atlantic County Utilities Authority wind farm, with five turbines would not exist. (44)

RESPONSE: The permit-by-rule is intended to facilitate construction of small wind turbines such as those that are likely to be installed at single family homes. All other wind turbines are subject to either a coastal general permit or individual coastal permit application process. There is no limit on the number of turbines or rotor swept area for individual permits. The five Atlantic County Utilities Authority wind turbines have a cumulative rotor swept area of approximately 250,000 square feet which would have required an individual permit under the adopted amendments.

261. COMMENT: The permit-by-rule for solar panels at N.J.A.C. 7:7-7.2(a)13ii requires that the solar panels be located a minimum of 50 feet from the inland limit of any

wetlands, beach or dune. Is the solar panel development including appurtenant connections required to meet this setback requirement or just the panels themselves? (28)

RESPONSE: The solar panel development including all appurtenant connections must be set back 50 feet from the inland limit of any wetlands.

262. COMMENT: The permit-by-rule authorizing the installation of solar panels at a single family home or duplex on a maintained lawn or areas of land that have been manipulated through landscaping and are maintained as such is supported. (23)

RESPONSE: The Department acknowledges this comment in support of the rule.

263. COMMENT: The permit-by-rule at N.J.A.C. 7:7-7.2(a)13 should be expanded to include the installation of solar panels at any site, that is residential, commercial or government, which is not being maintained in its original state. This revision is appropriate due to the nature of ground-mounted solar energy systems. Specifically, a provision should be added which provides that no more than five percent of the designated development area is utilized for impervious system components such as piers or equipment pads but excluding the solar panels themselves and all other disturbed areas of the site be restored to pre-disturbed conditions.

This change is appropriate as it is consistent with the Department's stated purpose of limiting the permit-by-rule to maintained lawn or landscaped areas at single family homes or duplexes because the size of solar panels at single family homes or duplexes does not require significant site disturbance and therefore does not require review. The site disturbance for any ground-mounted system can be minimized regardless of its size. Further, there are substantial environmental benefits that can be achieved from prudently adding solar energy systems to maintained lawn or landscaped areas at corporate campuses, existing commercial and industrial facilities, municipal properties and educational institutions. For example, a 1MW SunPower system can occupy as little as three acres and deliver more than 1.3 million kWh of clean, carbon-free electricity

annually, with no noise, minimal periodic maintenance and nearly undectable impact on groundwater runoff. In aggregate, these benefits far outweigh the minimal and temporary impact that may occur when the systems are installed in areas which are already being maintained in another than natural state. (23)

RESPONSE: As stated in response to comments 250 and 251, the Department believes that recent legislative changes appropriately address this issue.

N.J.A.C. 7:7-7.30 Coastal general permit for the construction of one to three wind turbines less than 200 feet in height and having a cumulative rotor swept area no greater than 4,000 square feet.

264. COMMENT: It is not clear what would constitute a "site" under the proposed regulations. Is a site defined by the owner, size of property or type of structure? For example, an owner may have 50 acres including five buildings. Will this owner be allowed three turbines for the whole property or three per building or three per average size of a residential property, which is the smallest property unit permitted to have up to three turbines? The Board of Public Utilities, Office of Clean Energy, defines a site as a meter. Will the Department's regulations define this in the same manner? (7)

RESPONSE: Both the Coastal Zone Management rules and Coastal Permit Program rules define "site" as the lot or lots upon which a proposed development is to be constructed. Therefore, per the commenter's example, a 50 acre parcel with five buildings would be eligible for a maximum of three turbines under the coastal general permits or permit-by-rule. If more turbines were proposed, an individual permit would be required. If the parcel had been subdivided, the regulation at N.J.A.C. 7:7-2.1(b)8 regarding common ownership of adjacent properties in the CAFRA area would apply.

265. COMMENT: The coastal general permit at N.J.A.C. 7:7-7.30 allows for the installation of up to three wind turbines provided the cumulative rotor swept area does

not exceed 2,000 square feet. In reality, this will prohibit the multiple installations of many small wind turbines. A 20 KW Jacobs has a rotor swept area of 754 square feet. Three units will have a cumulative rotor swept area of 2,262 square feet. A Proven 15 KW turbine has a rotor swept area of 683 square feet. Three of these units will have a total rotor swept area of 2,049 square feet exceeding the cumulative 2,000 square feet afforded under the general permit. Therefore, even though the general permit allows for up to three wind turbines on a site, the 2,000 cumulative rotor swept area requirement will severely limit small wind turbine installations, resulting in a lesser amount of renewable energy production in New Jersey. (11)

RESPONSE: Although the construction of three of the wind turbine turbines cited by the commenter at a site exceeds the limits of the permit-by-rule, they could qualify for a coastal general permit. The size limitations are based on the potential impacts of the wind turbines on birds and bats. As discussed in the proposal summary at 41 N.J.R. 3174, post-construction monitoring of the first 15 wind turbines constructed under the coastal general permit at N.J.A.C. 7:7-7.30 is required to assess the impact of the operation of the larger size wind turbines on avian and bat species. The results of this monitoring will enable the Department to evaluate the impacts of these turbines and adjust the general permit requirements and/or curtailment requirements as appropriate.

266. COMMENT: The Department should provide a specific explanation of the studies, data, or principles that informed the determinations of the number of turbines that can be built and the total possible rotor swept area under the coastal general permits at N.J.A.C. 7:7-7.30 and 7.31. (20)

RESPONSE: Given that the coastal area of New Jersey is part of the globally significant migratory corridor as well as critical habitat to numerous resident species, the Department took a tiered approach to wind turbine development on land with wind turbines having the lowest potential impact qualifying for authorization under a permit-by-rule and the level of Departmental review increasing as the potential impacts

associated with the location, height and rotor swept area increase. Literature cited in the proposal summary shows that as the scale of wind turbines and number of turbines increases, the impacts to birds and bats also increases. As stated in response to comment 98, the Department is concerned that turbines with a rotor swept area from 2,000 square feet to 4,000 square feet may pose a greater risk to birds and bats. Therefore, the Department is requiring a general permit application for such turbines, to allow it to review the specific location where such a turbine is proposed. In addition, the Department is requiring post-construction carcass surveys through monitoring of the first 15 such turbines constructed to evaluate whether these turbines are causing unanticipated levels of direct mortality to birds and bats. Based on the monitoring data gathered from wind turbines in the coast and elsewhere, and information from published or unpublished studies or data, the Department will refine the rules including the standards of the coastal general permits as appropriate.

267. COMMENT: The Department should utilize the data collected from the pre- and post- construction monitoring required under the Energy facility use rule to assess the efficacy and cumulative impact of the permit-by-rule and coastal general permits. (20)

RESPONSE: The Department will use the data collected from the pre- and post-construction monitoring and any other relevant data to assess the impacts of the coastal general permits. Neither pre- nor post- construction monitoring is required for the permit-by-rule.

268. COMMENT: The height and rotor swept areas proposed under N.J.A.C. 7:7-7.30 are more restrictive than necessary in order to balance the need to protect habitat from the alleged harms of renewable energy against the documented harms caused by continued protection of electricity from fossil fuels and the increased damage caused by global warming. (34)

RESPONSE: For the reasons described in response to comments 109 and 253, the Department believes that the standards for the coastal general permit at N.J.A.C. 7:7-7.30 are appropriate. If a proposed turbine does not qualify for this coastal general permit, a coastal general permit for larger wind turbines at N.J.A.C. 7:7-7.31 is also available.

269. COMMENT: The proposed general permits will not have major impacts to military missions, as the proposed rule primarily addresses environmental and avian impacts of wind turbines and does not speak to possible military impacts. The coastal general permits allow wind turbines that are up to 250 feet in height. At this height, military operations should not be affected, although this would vary on the proposed location of the facility. Wind turbines may potentially interfere with radar operation and flight operations as well as approaches to military training areas depending on the location of the turbine. Any potential impact to radar and flight operations could be mitigated through coordination with the United States Department of Defense regarding the siting of proposed wind turbine facilities. Information on potentially adverse impact of such projects on Department of Defense activities can be found in the Report to Congressional Defense Committee. *"The Effect of Windmill Farms on Military Readiness,"* available at http://www.defenselink.mil/pubs/pdfs/WindFarmReport.pdf.

To address potential impacts on military activities, it is requested that permit applicants be required to demonstrate Department of Defense concurrence for any projects located within 2 miles of a Department of Defense Installation, Military Training Route or Special Use Airspace. The Department of Defense would need a written request for concurrence on a proposed project that provides the number, type, height and configuration of proposed wind turbines. As a result, the Department of Defense would concur, not concur or provisionally concur with the location of the proposed turbine based on measures taken to mitigate the impact on the Department of Defense mission.

Helicopter operations by the New Jersey National Guard may be affected by the construction of wind energy facilities since they may involve emergency response in any part of the State, not just the CAFRA area. It is requested that a mechanism be developed to ensure that the New Jersey National Guard is notified when construction of a wind

turbine is proposed anywhere in the State. While this may involve other State agencies, it is requested that the Department assist in the development of an outreach plan to address this issue. (41)

RESPONSE: The Coastal Zone Management rules contain standards that would enable the Department to consider the potential interference of proposed wind turbines with military operations, including the Special hazard areas rule, N.J.A.C. 7:7E-3.41, which addresses coastal development within special hazard areas such as navigable air space, and the Basic location rule, N.J.A.C. 7:7E-6.2, which allows the Department to reject or conditionally approved proposed development as reasonably necessary to promote the public health, safety and welfare. The Department will take note of these concerns in reviewing applications for individual permits, such that they are addressed in the Environmental Impact Statement or Compliance Statement that accompanies each coastal permit application in accordance with N.J.A.C. 7:7-6.1 and 6.2. Moreover, the issuance of a coastal permit does not relieve the applicant of responsibility to secure any other approvals required by other governmental entities.

7:7-7.31 Coastal general permit for the construction of wind turbines less than 250 feet in height and having a cumulative rotor swept area no greater than 20,000 square feet

270. COMMENT: The application requirements for the coastal general permit at N.J.A.C. 7:7-7.31 require submission of five copies of a site plan that shows the existing features of the site including topography, structures, utilities, beach areas, dune areas, coastal bluffs and floodways. These requirements should be expanded to include landscape mapping so that both the applicant and the Department are aware of the presence of rare, threatened and endangered species in and around the site. By including a mandatory requirement of consideration of landscape mapping at the application stage itself, the applicant and the Department can ensure protection of rare, threatened and

endangered species, which may be potentially vulnerable to the operation of the wind turbines on the site. (20)

RESPONSE: To be eligible for the coastal general permit at N.J.A.C. 7:7-7.31, no portion of the proposed wind turbine can be located within areas mapped as threatened or endangered wildlife species habitat on the Department's Landscape Maps. Therefore the Department did not require submission of the landscape map. During the permit application review, the Department will ensure that no portion of the proposed wind turbine is located in a mapped area.

271. COMMENT: Under the coastal general permit at N.J.A.C. 7:7-7.31, wind turbines cannot be located in and around dunes, beaches, wetlands, coastal bluffs, or Wild and Scenic River corridors. The Department is commended for prohibiting the construction of wind turbines in the above-mentioned areas, all of which are extremely environmentally sensitive. However, it is recommended that maritime forests (Atlantic and Delaware Bay) be included as areas where the construction of this class of wind turbine is prohibited. Maritime forests must be included in this list of prohibited areas in light of the significant importance of these forests to migrant land birds. (20)

RESPONSE: The Department acknowledges this comment in support of limitations applicable to the coastal general permit. With respect to maritime forests, extensive areas of maritime forests are included in the Department's Large Scale Wind Turbine Siting Map which was developed based on species impacts. Areas of maritime forests that are not included on the map would in most cases be considered critical wildlife areas as they are specific areas known to serve an essential role in maintaining wildlife, particularly in wintering, breeding and migrating. Under this general permit, compliance with the critical wildlife habitat rule is required.

CHAPTER 7E

COASTAL ZONE MANAGEMENT RULES

SUBCHAPTER 7. USE RULES

7:7E-3.38 Endangered or threatened wildlife or plant species habitats

272. COMMENT: The Department should not include areas that serve an essential role as corridors for movement of endangered or threatened species wildlife, including seasonal migratory routes and daily routes between foraging and roosting or nesting habitats, as endangered or threatened species habitat. Tracing the routes of endangered or threatened species will place an untold financial burden on permittees as surveys would need to be extended beyond the project site and require applicants to identify previously known routes, including tracking studies. How will the Department decide whether a project site lies within an area that serves an essential role as corridors for movement of endangered or threatened wildlife species? Will permittees be required to conduct surveys proving the presence or absence of rare species corridors for all projects located in the CAFRA area? Will certain projects with little environmental impact (i.e. those in heavily urbanized areas) be exempt from conducting surveys to identify endangered or threatened species corridors? (37)

273. COMMENT: While protection of threatened and endangered species and their habitats is supported, seasonal migratory routes and wildlife movement corridors are not static or easily defined for planning or protection purposes. As a consequence, the inclusion of these areas as threatened and endangered wildlife species habitat will add a significant burden to utility infrastructure planning and development. (17)

RESPONSE TO COMMENTS 272 AND 273: In accordance with N.J.A.C. 7:7E-3.38, endangered and threatened wildlife habitat includes areas known to be inhabited on a seasonal or permanent basis by or to be critical at any stage in the life cycle of any endangered or threatened wildlife. The amendment to N.J.A.C. 7:7E-3.38(a) merely clarifies that areas critical at any stage in the life cycle of an endangered or threatened wildlife includes areas that serve an essential role as corridors of movement of

endangered or threatened wildlife. The applicant will not be required to conduct an endangered species survey to determine corridors for movement of endangered or threatened wildlife species. Accordingly, the Department does not intend to require an endangered or threatened species survey to make a decision on an application for land-based wind turbines. The intent of the endangered or threatened wildlife or plant species rule is to ensure the continued survival of the population of endangered or threatened species. Wind turbines have the potential to adversely affect birds and bats as they move through the air. Because both birds and bats fly over urban areas, the level of urbanization of a site does not mean that a site is not a travel corridor. The effects of wind turbines depend on the height of turbines, the rotor swept area of the turbines, their location, and the behavior of the birds in the area, including daily activities and migrations. To avoid irreversible impacts to species, the Department must consider each of these factors.

7:7E-3.49 Atlantic City

274. COMMENT: Under the proposal, it is easier to build casinos, malls, roller coasters and Ferris wheels on a pier in Atlantic City than wind turbines. The rules allow a 10 story 3 million square foot casino on an ocean pier and under this proposal only one wind turbine would be allowed on the same pier. (44)

RESPONSE: The amendments to the Atlantic City rule allow for the construction of wind turbines on the ocean piers in Atlantic City. Further the amendments allow the construction of wind turbines up to 200 feet in height on the piers. The rules do not limit the number of turbines that could be constructed on the piers.

7:7E-3C.2 Standards for conducting Endangered or Threatened Wildlife or Plant Species Habitat Impact Assessments

275. COMMENT: To the extent that the proposed changes to N.J.A.C. 7:7E-3C.2 apply to all projects and not only solar and wind projects, the proposed changes are supported. (34)

RESPONSE: The Department acknowledges this comment in support of the rule. The proposed amendments are intended to address movement corridors and aquatic habitat regardless of the type of project proposed.

7:7E-7.4 Energy facility use rule

276. COMMENT: The rule currently requires new energy facilities that are not water dependent be located at least 500 feet inland of the mean high water line of tidal waters. Under this proposal, this setback will be reduced to 50 feet for wind and solar energy facilities since these facilities would not be anticipated to have the same mass and impact as other energy facilities addressed by the energy facility use rule. This change is appreciated and considered a positive step forward. (11)

277. COMMENT: The Department's proposal to amend the energy facility siting standard at N.J.A.C. 7:7E-7.4(b) to reduce the existing setback for wind and solar energy facilities is supported. The Department's assessment that reducing the setback from 500 feet to 50 feet will facilitate siting of these renewable energy facilities while providing an adequate setback for wildlife use of tidal waters is accurate. (23)

RESPONSE TO COMMENTS 276 AND 277: The Department acknowledges these comments in support of the rule.

278. COMMENT: On December 3, 2009, the Borough of Union Beach held a public meeting to hear the residents' concerns regarding the construction of a wind turbine facility at the Bayshore Regional Sewerage Authority site. Approximately 80 people attended the meeting with 25 people providing oral comments. Tapes of the public

meeting were submitted by the commenter. In December 2008 representatives of the Bayshore Regional Sewerage Authority presented plans for the construction of a wind turbine at their facility to the Borough. Although the representative indicated that they would hold open forums to discuss the proposal with the residents of the community, this did not occur. The effect of wind turbines on this small community is of concern. The Department must seriously consider the impacts of the construction of a wind turbine at this facility. (43)

RESPONSE: Comments submitted on a particular project are beyond the scope of a rulemaking adoption. There is a separate public process for the submittal of comments on a particular coastal permit application. This process is set forth in the Coastal Permit Program rules at N.J.A.C. 7:7-4.

The Department assumes that the commenter is objecting to the amendment that reduces the setback requirement for wind and solar energy facilities from 500 feet from the mean high water line to 50 feet, thereby allowing a wind turbine to be sited at the Bayshore Regional Sewerage Authority site. The Department reduced the setback requirement since wind and energy facilities are not anticipated to have the same mass and impact as other energy facilities addressed by the Energy facility use rule, N.J.A.C. 7:7E-7.4. The Department believes that reducing the setback from 500 feet to 50 feet will facilitate siting of these renewable energy facilities while providing an adequate setback for wildlife use of tidal waters.

279. COMMENT: There is little likelihood that a small wind project situated at the Morey's Pier site in Wildwood would have a major impact on wildlife. In fact, the impact from the turbines would not be biologically significant. The rules should allow siting of wind turbines at this and other similar locations or there should be an exception to the rules for already intensively developed sites. (18)

RESPONSE: Given the height of buildings and other structures existing in Atlantic City, the Department determined that the construction of wind turbines on the Atlantic City

ocean piers is acceptable provided they are 200 feet or less in height. The Department does not anticipate that this amendment will result in increased impacts to wildlife since the rule currently allows structures up to 200 feet in height on the piers and buildings greater than 300 feet in height line the shoreline immediately adjacent to the piers. The Department included the most southerly 20 km of the Cape May peninsula on its Large Scale Wind Turbine Siting Map as this is an area of highly significant bird concentration for many migrating birds. The mapped area includes all land within the lower Cape May peninsula and continues northward to a point roughly three kilometers north of Cape May Court House, including the Wildwoods. These areas are where the Department has determined that the installation of large-scale wind turbines is unacceptable due to potential impacts on migratory and resident birds and bats.

280. COMMENT: The proposed rules provide an opportunity for New Jersey to demonstrate to the nation how states should responsibly develop their offshore energy resources in a manner that is consistent with the protection of coastal habitats and marine resources, including fish and wildlife. Before ocean renewable energy projects are deployed en masse, there is the opportunity to identify and protect those areas of the ocean that would be particularly sensitive to renewable energy production because they support vulnerable species populations, contain unique habitats, or have other important ecological attributes. There is also the chance to recommend those areas best suited for renewable projects because of their high energy yield characteristics and because they will have the least impact on the marine environment. (20)

RESPONSE: The Department will use the information obtained through the baseline study, the demonstration project and projects in Federal waters to identify areas that are most ecologically important and use that information in reviewing applications for wind turbines in ocean waters.

281. COMMENT: Although the rules strictly limit the construction of near shore commercial scale wind facilities along New Jersey’s Atlantic Coast where there are

documented occurrences of important wildlife populations which could be at risk from the operation of such facilities, there are expansive areas in adjacent Federal waters that are available for large scale wind energy development which the State is actively promoting as an element of the State's Energy Master Plan.

While the Department currently lacks scientific knowledge regarding near shore use by avian species, marine mammals, and migratory fish, it is in the process of completing the Ecological Baseline Study of the marine environment out to 20 miles offshore of New Jersey. As data gaps are filled and additional relevant research conducted, it will be imperative for the Department to modify the rules in a timely manner to reflect the best available science and data concerning the impacts of wind energy on wildlife and habitats. (47)

RESPONSE: The Department intends to use the results of its baseline study, information from the demonstration project and projects located in Federal waters to modify the rules to address the impacts of wind energy on wildlife and habitats, as appropriate.

282. COMMENT: The rules' general exclusion of offshore wind projects from tidal waters of the State at the current time is supported. As the proposal acknowledges, there is insufficient information to make a determination that offshore wind energy development is consistent with the State's policies on coastal management, or appropriate for the State's waters. (10)

RESPONSE: The Department acknowledges this comment in support of the rule.

283. COMMENT: Upon completion of the current Ecological Baseline Study and the development of risk assessment, environmental impact and cumulative impact studies utilizing that information, the State will be better positioned to evaluate the appropriateness and necessity of wind development within State waters. Critical to those considerations will be the recognition and assessment of the high utilization of near shore

waters by both wildlife and human uses, and the likely degree of conflict engendered by large-scale wind turbine development there. (10)

RESPONSE: The Ecological Baseline Study final report issued in July 2010 includes a map identifying the relative environmental sensitivity of different locations within the Study Area, as well as maps identifying temporal and spatial use of the baseline study area for birds, marine mammals and various ocean uses. The report is available on the Department's website at http://www.nj.gov/dep/dsr/ocean-wind/report.htm.

284. COMMENT: The Department should include in the rules, environmental standards that will apply to offshore projects. Environmental criteria should be developed to protect sensitive areas of the ocean that support vulnerable populations, contain unique habitats, or have other important ecological attributes. (20)

285. COMMENT: The rule authorizing the offshore project at N.J.A.C. 7:7E-7.4 contains no guidance or standards regarding what will actually be assessed, and no limitations on other approvals until results of the demonstration project are assessed and their implications for current or future policy addressed, despite its proposed justification as a "demonstration project." (10)

286. COMMENT: In the preamble to the proposed regulations, the Department addresses the potential for wind turbines to impact breeding and migration for avian species and bats, as well as marine organisms in the case of wind turbines located in tidal waters. As a result, the Department has limited the availability of permits-by-rule and general permits for wind turbines. Focusing in particular on large scale wind turbines, the Department has opted for the detailed review afforded through the individual permit application process so that a case-by-case determination of the suitability of the affected geographical area can be made. This includes consideration of seasonal migratory routes as well as daily routes between foraging, nesting and roosting habitats. While the Department's preference for case-by-case determinations is clear, the proposed

regulations do not identify the standards that will govern those determinations. Without such standards, the individual permitting process for large scale wind turbines will be prolonged and complicated. (17)

RESPONSE TO COMMENTS 284 THROUGH 286: The Department will use the existing environmental standards contained within the Coastal Zone Management rules, N.J.A.C. 7:7E including special area and resource rules when reviewing offshore wind energy projects and large scale wind turbine projects located on land. These rules address sensitive coastal and marine resources, such as endangered and threatened species, wildlife, and marine fish and fisheries. For land-based turbines, the Department provides further protection through use of the Large Scale Wind Turbine Siting Map to address operational impacts to birds and bats. The demonstration project in State ocean waters is expected to provide data that will assist the Department in evaluating the impacts of wind turbines on marine resources. A change to the rules would be necessary to allow the construction of additional turbines in State ocean waters. There is no such limitation for Federal waters. However, as monitoring data from wind turbines operating in New Jersey and elsewhere becomes available, the Department will evaluate this data along with published and unpublished scientific data, in order to assess the impacts of turbines on coastal resources, and how those impacts relate to size, location, and other factors. Based on those evaluations, the Department will modify its rules to provide more protection where needed and streamline permitting where appropriate.

287. COMMENT: The technical manual, Large Scale Wind Turbine Siting Map and rule proposal should have evaluated the impact to birds, bats, whales and sea turtles by ambient temperature rise, increase in sea level, geological changes, and climate related habitat loss based on the gross elimination of wind turbine use from the large area of the coastal zone that is no closer than 2.5 nautical miles to the mean high water line as set forth at N.J.A.C. 7:7E-7.4(b)3ii(2). This area, over 400 square miles has been removed from consideration. (27)

RESPONSE: Bird and bat densities are significantly greater nearer to the shore. Moreover, using current technology wind turbines are being constructed in water depths up to 100 feet deep, and technology continues to push such development to greater depths. Therefore the restriction on construction of wind turbines in ocean waters within 2.5 miles of shore does not preclude fulfillment of the Energy Master Plan goals for offshore wind production.

288. COMMENT: Proposed N.J.A.C. 7:7E-7.4(b)3iii would allow construction of a maximum of five wind turbines with each turbine's power rating as determined by the manufacturer not to exceed five megawatts, while proposed N.J.A.C. 7:7E-7.4(r)1viii(3) would require a habitat evaluation, impact assessment and post-construction monitoring of wind turbines placed in State waters to "establish the abundance, distribution and behavior of avian species, bats and marine organisms and assess the impacts of the construction and/or operation of these facilities on these species." The proposed amendments allowing a demonstration project in the State's ocean waters provide much needed regulatory structure and environmental guidelines for offshore wind projects in State waters and support the development of a small-scale demonstration project to inform and assess future offshore wind development. Demonstration projects can play an important role in offshore energy development, including offshore wind. Although several offshore wind projects have been proposed in the coastal waters of New Jersey and other coastal regions of the United States, no such development currently exists. This important step is also consistent with the recommendation of New Jersey's Blue Ribbon Panel on Development of Wind Turbine facilities in Coastal Waters which determined that a demonstration project was needed to inform the current dearth of information and experience with offshore wind in the United States. (50)

289. COMMENT: The commenters stated that they were encouraged by the New Jersey Blue Ribbon Panel's recommendation that the State first pursue an offshore wind demonstration project to analyze the economic, environmental and supply chain issues related to offshore wind. The commenters stated that they were further encouraged by

the proposed amendments to the Energy facility use rule which contemplates the permitting of a 20MW demonstration project in New Jersey's ocean waters. The demonstration project should be sited in the area covered by the Ecological Baseline Study.

Offshore wind is becoming a major contributor to meeting Europe's energy needs. Many of the conditions in the United States are similar to those in Europe. Having a demonstration project will provide real data upon which future State energy and ocean management decisions can be based. The implementation of the proposed rule will need to be cognizant of the economic limitations of a small wind demonstration project. The impacts of a 20MW demonstration project should be minimal and the gains could be great. A demonstration project would offer New Jersey the following benefits: site specific environmental data during construction and operation; an economic revitalization for some coastal industries and areas; and development of a supply chain for a promising renewable technology and the green collar jobs that will be necessary. (6, 16)

RESPONSE TO COMMENTS 288 AND 289: The Department acknowledges these comments in support of the rule.

290. COMMENT: Small demonstration wind farms are not economically attractive and New Jersey should be commended not only to encourage one, but to do so in an expedient manner so as to instill confidence that New Jersey is poised to do business with internal equipment manufacturers. A demonstration project will provide the environmental demonstration called for by the Blue Ribbon Panel and the proposed rules. After the demonstration project, it is anticipated that no other demonstration projects will be built in New Jersey waters for the economic reasons outlined above. Moreover, it is anticipated that all utility scale projects will be located in Federal waters and likely to be six or more miles from the shore. Currently three projects with leases from the Minerals Management Service are proposed to be located 10 to 16 miles offshore of New Jersey. (6)

RESPONSE: The Department acknowledges this comment in support of the rule.

291. COMMENT: Atlantic City as a "host" for the offshore wind turbine demonstration project is ideal for a multitude of reasons. Not the least of these reasons is that the city is anxious to be the "host" to the project, providing Atlantic City with unique branding opportunities. Furthermore, the economic multiplier effect for Atlantic City would be significant, as the first United States offshore wind facility would undoubtedly become a major draw for developers, investors, renewable energy/clean technology, utility, energy equipment and many other firms and individuals interested in renewable energy. Other New Jersey resorts would not be as motivated as Atlantic City, and the Department should maximize its advantages to propel a demonstration project. (6)

RESPONSE: Like any coastal permit application, the demonstration project, within the Ecological Baseline Study area, will be evaluated under the applicable Coastal Zone Management rules.

292. COMMENT: A small demonstration project is a compelling idea and plan for New Jersey as it:

1. Provides a fast bridge to an industrial-scale industry and thus a pathway and game plan to job development in New Jersey;
2. Fulfills the mandate and impact testing recommendation of the Blue Ribbon Panel;
3. Allows environmental impacts to be tested in a small project with limited effects;
4. Can be built quickly with existing construction assets, accelerating the development of larger projects;
5. Has the support of New Jersey environmental groups; and
6. Is readily financeable once the project has revenue certainty and once it has permits for construction. (6)

RESPONSE: The Department acknowledges this comment in support of the rule.

293. COMMENT: If New Jersey wants to attract manufacturing jobs associated with the offshore wind industry by jump starting the offshore wind industry in the United States through a demonstration project, New Jersey's best and only logical location is State waters off of Atlantic City. Without the demonstration project, offshore wind in New Jersey has no real chance of environmental monitoring on a demonstration level and the process of developing offshore wind in New Jersey is effectively stalled, which would allow other East Coast states to take the dominant lead in attracting assembly and/or manufacturing investment and their associated green jobs. (6)

294. COMMENT: Offshore wind projects should not be limited to one small 25 Megawatt demonstration project. To single out and give a break to just one company is arbitrary and capricious. Demonstration projects should be allowed for multiple companies or no companies at all. (44)

295. COMMENT: There should not simply be one demonstration project but multiple projects available to different developers at many different locations including areas that are currently off-limits to development under this proposal. (5)

RESPONSE TO COMMENTS 293 THROUGH 295: The rule would apply to any company or companies applying for the construction of a wind energy facility in the State's ocean waters. Because the impacts of the construction of large scale wind turbines in offshore waters are not well understood, the Department is limiting the number and size of the turbines allowed in New Jersey's offshore ocean waters. While the Department is limiting the number of wind turbines in State waters, there is no such limitation on the construction of wind turbines in Federal waters.

296. COMMENT: The limitations on the demonstration project should be modified by inserting "approximately" to the requirement relating to the power rating of the turbines to add flexibility. Additionally, references to 20 megawatts should be to net megawatts. The maximum number of turbines allowed under the demonstration project should be

increased from five to nine. Five appears to be an arbitrary limit. If it is based on the assumption of a 4 to 5 megawatt sized turbine, these turbines are not available for the United States (60 hertz market and there are no vessels in the United States that could install them). A demonstration project could use commercially available marinized turbines sized between 2.3 and 3.6 megawatts, such as those manufactured by Siemens or Vestas. A 20 megawatt net project could utilize nine 2.3 and 3.6 megawatt turbines or six 3.6 megawatt turbines. Economies of scale dictate that a facility size less than 20 megawatts net would be economically unfeasible. Setting absolute limits for these parameters would severely restrict the developability of the demonstration project and flexibility in negotiating with equipment suppliers. Twenty megawatts is a good approximate target for net megawatt output, but power output will vary depending on the number and the exact nameplate capacity of turbine models as well as mechanical losses and electrical line losses.

There are numerous trade-offs with a small-scale demonstration project:

1. It is a simple economic fact of scaling that the larger the project, the more economical the overall project cost will be. Not only will the aggregate cost per turbine be lower because of the relative strength of customer and vendor, but the lower the absorption of on-time development costs per turbine will be. Development costs are relatively insensitive to the size of the project. A small project will have the same engineering and mobilization costs of a large project, but will have significantly less production capability to defray these costs. The more economical the project, the lower the price of power to the public. Therefore, the demonstration project should be as large as possible in MW capacity, while being small enough to limit the environmental risks, if any, of a demonstration project;

2. It is clearly possible to infer from the environmental literature that a smaller number of turbines will affect a smaller population of marine life. Therefore a project should be as small as possible measured in number of turbines, and the size of each turbine should be as large as possible. This reduces the number of foundations and total impacted sea-bottom area;

3. Currently available installation and construction assets will have difficulty assembling large turbines. Therefore the size of each turbine should be matched to currently available equipment in the United States and the available wind regime at a State waters site. The larger 5 MW machines currently are not efficient at the lower wind speeds experienced in State waters. While some of the manufacturers are working on new blades for these larger machines, today we are unable to conclusively adapt a 5 MW machine to the wind regime in State waters. The Department in adopting the rule should be firm on the 25 MW maximum capacity of the demonstration project, but should allow flexibility up to eight turbines.

The final selection of a turbine vendor and procurement plan will balance the merits of each of these and many similar considerations. United States and foreign vendors who would qualify for such a procurement plan currently manufacture offshore turbines, in assembly facilities outside of the United States ranging in nameplate capacity from 3.6 MW to 5 MW. The commenter considers four to five such vendors to be qualified and is currently negotiating with them to provide equipment economically. Moreover, this process will stimulate the interest of all vendors to consider New Jersey as being serious to develop the three projects with interim licenses in Federal waters.

It is recommended that the final rule relating to the demonstration project in the Ecological Baseline Study Area allow no more than 25 MW of name plate capacity but up to eight turbines in order for the amount of turbines to be optimized without exceeding 25 MW, providing the most economical project within that demonstration project scale size. (6)

RESPONSE: The rule provides for the construction of a demonstration project with a total power rating of 25 megawatts. The Department did not use net megawatts because it is variable depending on specific conditions throughout the year. The Department is using the manufacturer's power rating because it is the standard industry method for rating the wind turbine output. Further the rule does not require that the turbines be five megawatts; instead this is the maximum power rating for each turbine. Turbines may have a lesser power rating. Because the impacts of construction of large scale wind

turbines in offshore waters are not well understood, the Department's proposal limited the number of wind turbines allowed in New Jersey's offshore ocean waters to five. It was clearly the Department's intention to provide the ability to construct a project in the State's ocean waters and therefore the project must be viable. When proposing the rule, the Department was of the understanding that a project consisting of five 5 MW turbines would be viable. However, based on the above comment, it appears that this may not be accurate. Therefore, the Department has determined that the rule should be changed on adoption to provide for the construction of either five 5 MW turbines or six 4 MW turbines. Either of these scenarios would result in a demonstration project with a total power rating of 25 MW or less. Although the footprint of a six turbine project would be greater than that of a five turbine project, the rotor swept area would be less (approximately 618,000 square feet for six 4 MV turbines as opposed to approximately 671,000 square feet for five 5 MV turbines). The Department is providing for the construction of a viable demonstration project in order to better understand the impacts of large scale turbines offshore of New Jersey.

297. COMMENT: The limitations on the demonstration project should be modified by inserting "approximately" to the requirements relating to the location of the project relative to the mean high water line to add flexibility. Setting absolute limits for this parameter would severely restrict the developability of the demonstration project and flexibility in negotiating with equipment suppliers. For example, optimal turbine placement might require that one or more of the turbines be set slightly closer to shore than 2.5 miles so as to avoid performance interference within the wind farm or avoidance of a shoal or sensitive environmental area. (6)

RESPONSE: The rule does not preclude the demonstration project from a linear arrangement which could still be located within the specified area.

298. COMMENT: The proposal should have taken changes in technology into account. Wind turbines in New Jersey's ocean waters are limited to 5 Megawatts without the

consideration that advances in technology may allow for smaller turbines to produce more electricity. There should be no limits to the amount of electricity produced by wind turbines. The limits should be based on the location and scope of the facility. (44)

RESPONSE: The adopted amendments only limit the power rating of the wind turbines that may be permitted in the State's ocean waters as a demonstration project. This limitation is appropriate because these turbines would be allowed as part of a small-scale demonstration project in the State's ocean waters to assist in assessing the impacts of large scale wind turbines in New Jersey's offshore waters. The adopted amendments do not limit the power rating and number of wind turbines in Federal waters.

299. COMMENT: The Department should consider a land-based large scale wind demonstration project. The Sea Girt National Guard Training Center project could serve as the land-based project. Some level of post construction avian and bat monitoring beyond typical carcass and removal studies and the use of curtailment methods such as the Merlin supervisory control and data acquisition radar system could be required. If the Department finds this unacceptable, then the provision for an offshore demonstration project should not be adopted because the Department's rules should not favor a particular project over another, they should be fair and equitable. (37)

RESPONSE: The rule does allow the construction of large-scale wind turbine developments on land in the coastal zone, although the construction is limited by factors such as location of wetlands, endangered species habitat and where birds and bats may be significantly adversely affected by the operation of wind turbines. Because large-scale wind turbines can be permitted on land, the Department does not see the need for a rule specifically for a demonstration project on land.

300. COMMENT: The rule should be postponed until June 2010, when the final results of the three primary field surveys are due. This is only eight months from the time of the public hearing and seven months from the close of the public comment period. (27)

RESPONSE: The Department assumes that the commenter is referring to the three primary field surveys (marine mammals, sea turtles, birds) that are part of the Ecological Baseline Study. This adoption does follow the release of the Final Report of the Ecological Baseline Study in July 2010. The baseline study final report will be used to help guide site selection.

301. COMMENT: The final rule must clearly identify the existing offshore development siting process for demonstration projects and full scale development and note how the process will continue to evolve. While the Department is to be commended for the thorough review of the available scientific materials it describes in the proposal, the agency does not explain how these studies or other factors informed its standard-setting process that enabled it to develop an offshore cap of five initial turbines. The rule needs to explain the process by which sites and the extent of development is determined for the demonstration projects, based on environmental criteria and the best available science. Further, the rule must provide a process by which it can be updated in a timely fashion once further information is available from the State's ongoing ocean/wind power Ecological Baseline Study or through new information from the renewable energy industry or the scientific community. The initial cap of five turbines, set through the State's existing siting process, should be considered subject to revision based on this further information and review. The Department is encouraged to provide a transparent explanation of the offshore development process set throughout these rules. (20)

302. COMMENT: An open and transparent process is critical to the success of New Jersey's efforts to responsibly develop renewable energy in State waters. While proposed N.J.A.C. 7:7E-7.4(r)3ii is supported, it is requested that additional information on the process used to develop the proposed rule as well as what process and criteria will be used for assessing potential expansion of offshore wind development within State waters once the demonstration project is complete should be provided. The Department should also clearly identify specific questions and issues to be addressed by any approved

demonstration projects, and explain how collected data will be analyzed in order to evaluate effects of construction and operation of these facilities and assess impacts of wind turbines in coastal waters. (50)

RESPONSE TO COMMENTS 301 AND 302: The Department believes that a small-scale demonstration project within the Department's Ecological Baseline Study area in State waters will be useful in assessing the impacts of large scale wind turbines located offshore of New Jersey. The impact assessment can be used in conjunction with the predictive modeling developed as part of the baseline study to assist the Department in siting potential wind energy facilities in New Jersey's offshore waters. The Department has developed the technical manual that provides guidance on monitoring and project data needs. The Technical Manual methods related to habitat evaluation and impact assessment are specific to a particular species or species group and consider specific attributes and characteristics of the pilot project site related to its suitability for particularly species or species group. The impact assessment would consider likely affects of the proposed pilot project on a particular species, considering accepted ecological principles and scientific literature on relevant species. The Department will use data provided by the applicant, the baseline study and the Coastal Zone Management rules, including requirements applicable to endangered or threatened wildlife or plant species habitats, critical wildlife habitats and marine fisheries to assess the approvability of the project. Pre- and post- construction monitoring data will be evaluated both to assess the validity of the impact assessment and to help guide wind development in the coastal regions of the State. Data will also be evaluated to determine how it can best be used in conjunction with the Baseline Study to guide future development and studies. As further information is developed and becomes available, the Department will continue to determine where changes can be made to the rule and Technical Manual that will both protect the environment and promote renewable energy. As with any rule, amendments to the Coastal Permit Program rules and Coastal Zone Management rules are subject to the rulemaking process set forth in the Administrative Procedures Act.

303. COMMENT: The rules fail to address policies and standards that the Department might apply to projects under Minerals Management Service jurisdiction through the federal consistency process. Issues of importance include: environmental impact particularly cumulative impact, displacement of commercial fishing from fishing grounds, impact on shoreside infrastructure from energy development and planning for onshore landing of cables. While there are current policies and regulations addressing several but not all of these issues, they bear reexamination in light of the large level of offshore energy development actively promoted by the State through the Energy Master Plan and other policies. (10)

RESPONSE: With the exception of N.J.A.C. 7:7E-7.4(b)3, the Energy facility use rule would apply to offshore renewable energy developments located in Federal waters through the Federal consistency provisions of the Federal Coastal Zone Management Act, 16 U.S.C. §§ 1451. In addition, as noted in response to comments 284 through 286 above, the Department will use the existing standards contained within the Coastal Zone Management rules, N.J.A.C. 7:7E, including special area and resource rules, when reviewing offshore wind energy projects located in Federal waters under the Federal Consistency provisions of the Coastal Zone Management Act. Further, the Ecological Baseline Study final report issued in June 2010 includes a map identifying the relative environmental sensitivity of different locations within the Study Area, as well as maps identifying temporal and spatial use of the baseline study area for birds, marine mammals and various ocean uses. In Federal waters, the Department will work with the Bureau of Ocean Energy Management, Regulation and Enforcement through its offshore alternative energy siting process and New Jersey task force. The Department will also use any protocols developed by the Mid Atlantic Regional Council on the Ocean (MARCO).

304. COMMENT: Considering New Jersey’s ambitious Renewable Energy Portfolio goals set forth in the Energy Master Plan, the Department must be prepared for additional wind development in both State and Federal waters beyond the 1000 megawatts already proposed for Federal Waters. While monitoring studies described in the technical manual

provide a good foundation for supporting a small-scale demonstration project as described at N.J.A.C. 7:7E-7.4(b)3ii, any expansion of wind development beyond five turbines will require additional data collection efforts such as pre-construction monitoring and the use of the Before-After/Control Impact study design currently being proposed for certain land-based wind facilities. (10, 50)

RESPONSE: With respect to the development of wind energy facilities in tidal waters, the rules require a habitat evaluation and impact assessment prior to making a decision on the issuance of a coastal permit. The technical manual provides guidance for conducting a habitat evaluation and impact assessment. The requirements vary depending on the location of the project, and are different for the ocean demonstration project and other wind projects in the ocean. See response to comments 165 through 167. Any expansion of wind development in the State's ocean waters beyond the demonstration project would be subject to further rulemaking at which time any additional requirements deemed appropriate based upon the results of the monitoring of the demonstration project would be proposed.

305. COMMENT: Requiring standard data collection methods for all proposed offshore wind facilities is essential to establishing consistency amongst and between facilities. Uniformity of data sets also allows for properly informed risk assessment models, technology comparisons, and cumulative impact analyses, all of which are critical components of scientifically sound regulatory decisions and Environmental Impact Assessments. According to a recently released document by the Mid-Atlantic Regional Council on the Ocean (MARCO), New Jersey has committed to lead efforts to begin to develop consistent survey and monitoring protocols to be used for individual offshore wind projects by March 1, 2010. The Department is urged to form a Science Advisory Team composed of oceanographers and marine scientists with relevant expertise in birds, bats, marine mammals, fish and benthic ecology from academia, government, industry and non-profit groups to assist and support the Department in determining the scale, scope and extent of data necessary to accurately predict risk to organisms and habitats

and to ensure protocols, criteria and models are based on objective, scientifically valid information. This information will be useful for offshore wind development within and beyond State waters. (10, 50)

RESPONSE: The Department agrees that standard data collection methods are an important aspect of examining the potential effects of offshore renewable energy projects. Many of these projects will be in Federal waters, where the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) is the lead and coordinating agency, and the agency that issues leases for renewable energy development. For example, through the BOEM New Jersey Task Force the State has been and continues to be in contact with BOEM and other Federal agencies concerning renewable energy uses of the outer continental shelf, including the data methods and needs for impact assessment. The State has been a national leader in conducting ecological baseline studies in the waters offshore of New Jersey to provide appropriate information for the siting of renewable energy facilities. The baseline studies were designed by the Department and Federal agencies considering the best available scientific methodologies and information from academia, industry and non-profit organizations. In addition to the BOEM New Jersey Task Force, the Technical Review Committee may be used to guide future efforts by the State, or the Department's Science Advisory Board may be consulted to provide such guidance. The MARCO workgroup has begun discussions of survey and monitoring protocols to be used for individual offshore wind projects.

306. COMMENT: In general, a demonstration project may assist the Department in evaluating the impact of wind turbines on various species. However, the demonstration project will be helpful only if it is scientifically selected and strictly monitored by the Department. The Department should take into consideration the following points for selecting and carrying out the demonstration project:

1. Selection: Appropriate standards for the selection of the demonstration project and its location should be adopted and selection must be done on the basis of a request for

proposal. The Department may consider setting up a scientific and technical committee to review and provide recommendations on such proposals.

2. Construction: Appropriate pre- and post- construction requirements should be imposed on the construction of the wind turbines.

3. Impact assessment: Because of the nature of a demonstration project and the general value of data collected from such a project, the project developer should have heightened obligations for impact assessment, including data collection and sharing. Specifically, the project developer should be required to conduct a more robust and detailed scientific impact assessment which should include troubleshooting methodology. Conducting impact assessments is a crucial requirement since otherwise the impacts found onsite will be non-comparable to anticipated impacts further offshore.

4. Monitoring: The Department should strictly regulate and monitor the demonstration project in all phases of the project: prior to construction, during construction and after construction is completed. Pre-construction monitoring is particularly crucial to establish ecological baselines for species for which local survey information may be lacking, such as many species of cetaceans.

5. Adaptive management: The Department should require that monitoring data be actively and periodically assessed to adjust and improve the effectiveness of regulations in minimizing negative environmental impacts of projects.

6. Information: Information regarding the process and standards for the selection of the demonstration project should be made easily available on the Department's website for public comments. Additionally, all information regarding selection, construction and impact of the demonstration project, including project proposals, impact assessments and any other documents should be made publicly available.

7. Verification: The data obtained from the demonstration project should be verified and accurately documented. Based on such information, the Department must take necessary steps to ensure that going forward the construction of wind turbines does not adversely impact natural resources, including various rare, threatened and endangered species. (20)

RESPONSE: The Department has identified the area in which the demonstration project shall be located, that is, in the State's ocean waters between Seaside Park and Stone Harbor and at least 2.5 nautical miles offshore. However, the Department will not be selecting the specific location within that area for the siting of the demonstration project. The Department will assess the information provided by the applicant through the required habitat evaluation and assessment in accordance with N.J.A.C. 7:7E-7.4(r)1viii. As with all coastal permit applications, the permit application including the habitat evaluation and assessment will be available for the public to review. Pre-construction data gathering and post-construction monitoring are required in accordance with N.J.A.C. 7:7E-7.4(r)1viii. Although the Department has reduced the habitat evaluation survey requirements for the demonstration project only, as discussed in response to comments 165 through 167, the information gathered from the demonstration project will be used in conjunction with the ecological baseline study results in the siting of wind turbine energy facilities in New Jersey's offshore waters. As stated previously, any expansion of wind development in the State's ocean waters beyond the demonstration project would be subject to further rulemaking at which time any changes in monitoring requirements deemed appropriate based upon the results of the monitoring of the demonstration project would be proposed.

307. COMMENT: Under the Energy Facility use rule, energy facilities are required to carry out thorough pre- and post- construction monitoring. The purpose of the rule is to minimize the adverse impact of the operation of wind turbines on various bird and bat species by guiding the Department's curtailment decisions. The Department's pre- and post construction monitoring data should be collected systematically and made publicly available and easily accessible such as through on line posting. (20)

RESPONSE: The Department intends to post its curtailment requirements on the Division of Land Use Regulation's web page. In addition, as noted in response to comment 177, the Department believes that the on-line posting of the monitoring data is a good goal and the Department will work towards such goal.

308. COMMENT: The Department is encouraging co-generation plants without designating a fuel. The fuel should be natural gas because coal is dirty. In addition, the height of smoke stacks or co-generation plants should be limited. (44)

RESPONSE: As specified in the proposal, prior to the adoption of these amendments, N.J.A.C. 7:7E-7.4(r)1v specified various standards applicable to cogeneration facilities and facilities that use renewable forms of energy. The Department proposed to separate the standards for these two types of facilities into separate subparagraphs. The standard for cogeneration of electricity and process steam, the provision to which the commenter refers, was proposed to remain at N.J.A.C. 7:7E-7.4(r)1v with no change in substance. Any cogeneration facility would have to comply with all environmental standards including air emission requirements.

309. COMMENT: The amendment proposed at N.J.A.C. 7:7E-7.4(r)1viii(3) that requires any wind facilities in State waters to conduct a pre-permit habitat evaluation and risk assessment and post-construction monitoring is strongly supported. (10, 50)

310. COMMENT: Advocates of offshore wind energy have always tempered support with the need to properly site any facility to ensure adequate environmental protection. As described in the technical manual, the habitat evaluation required for wind turbines placed in State waters includes specific data collection requirements that should provide the Department with critical information necessary to make an informed assessment of the appropriateness of the proposed site based on sound science.

Requiring the completion of the habitat evaluation and risk assessment prior to submission of an application should allow for proper site evaluation and help reduce risk to developers by approving or eliminating a proposed site before substantial time and money has been invested in the location. (50)

RESPONSE TO COMMENTS 309 AND 310: The Department acknowledges these comments in support of the rule. As discussed in response to comments 165 through 167, the Department modified the technical manual with respect to the demonstration project, such that the pre-permitting habitat evaluation will be based on existing data, as well as scientific literature and targeted survey work, and if a permit is issued, it will be followed by one year of pre-construction monitoring.

311. COMMENT: The requirement of post-construction monitoring for the offshore demonstration project has the potential to provide much needed information on how wind turbines impact abundance, distribution and migratory patterns of marine organisms. The technical manual states post-construction studies will, at a minimum include many of the surveys conducted prior to construction in order to assess impacts from operation of the turbines (for example habitat utilization, avoidance behavior), but refrains from providing specific requirements. While the need for adaptive management and project-specific flexibility is understood, there are certain aspects of post-construction monitoring that can and should be established in these proposed rules, including: a minimum time period for data collection; and a clear process for determining post-construction requirements. This process must also include opportunities for meaningful input from the interested public. (50)

RESPONSE: The rules provide flexibility with respect to post-construction monitoring of wind energy facilities in the ocean waters because the wind development in the water is anticipated to be located in Federal waters as opposed to State ocean waters. The Department anticipates that it will be working with the Bureau of Ocean Energy Management, Regulation and Enforcement in developing the monitoring program for energy facilities in Federal waters. Further, because the rules allow only one demonstration project, the Department would work closely with the developer to develop a comprehensive monitoring plan. The Department anticipates a similar protocol to the Ecological baseline study. This may include visual and acoustic surveys (for birds, bats, marine mammals and sea turtles) surveys for marine organisms (such as fish and benthic

species)) and avian radar. The Department anticipates that the monitoring would be at least as long in duration as that required for large scale wind turbines on land, which is two years. The public has input to both the coastal permitting process for the demonstration project and the Bureau of Ocean Energy Management, Regulation and Enforcement process for Federal waters.

312. COMMENT: The proposed rules need to address structure removal after the facility has been decommissioned. (50)

RESPONSE: The Department of the Interior's regulations concerning Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf contain decommissioning requirements. Permits issued for the construction of wind turbines will be conditioned upon removal of the structure upon decommissioning of the wind turbines.

313. COMMENT: The habitat evaluations required at N.J.A.C. 7:7E-7.4(r)1viii should be able to take into account the published portions of the New Jersey Ecological Baseline Environmental Data and reference relevant published data for other facilities. They should not be required to start de novo. (6)

RESPONSE: The Ecological Baseline Study report provides valuable data on natural resources and is expected to be useful as a planning tool and to guide site selection, but site specific data will still be required. The Ecological Baseline Study covers an approximately 1,300 square mile area. The sampling and design of the study will not provide a large amount of data for any given point.

314. COMMENT: The requirement of a risk assessment must also include an evaluation of cumulative impacts that considers how the proposed development might interact with other existing and proposed uses to negatively impact marine resources. (50)

RESPONSE: The Department will review applications for offshore wind under all relevant Coastal Zone Management rules, which will enable it to look at a broad range of issues and uses including navigation, recreational and commercial fishing, and natural resource protection. With respect to State ocean waters, the rule, as adopted, provides for the construction of a maximum of five 5 MW turbines or six 4 MW turbines, alleviating the need for a cumulative impact assessment. The Bureau of Ocean Energy Management, Regulation and Enforcement process in Federal waters includes a cumulative impact assessment.

315. COMMENT: The assessment of impacts of wind development within State waters on navigation must be considered. Offshore, the New Jersey coastal area is a highway of commerce entering and leaving the Port of New York and New Jersey. This cargo includes hazardous substances, oil and chemical tankers and general goods. An assessment and discussion must be included to ensure that projects, individually and cumulatively, do not pose navigational risks to these cargoes, as even a seemingly small oil spill can devastate our coast and the marine organisms that depend on it. (50)

RESPONSE: The Department will use the existing environmental standards contained within the Coastal Zone Management rules, N.J.A.C. 7:7E, including special area and resource rules when reviewing offshore wind energy projects. These include the navigation channel special area rule, N.J.A.C. 7:7E-3.6; the basic location rule, N.J.A.C. 7:7E-6.2, the port use rule at N.J.A.C. 7:7E-7.9 and the traffic resource rule at N.J.A.C. 7:7E-8.14. In addition, the United States Coast Guard is involved in reviewing impacts to Federal navigation channels.

316. COMMENT: While N.J.A.C. 7:7E-7.4 does not apply to offshore renewable energy developments located beyond the State's three nautical mile limit, the construction and operation of offshore renewable energy facilities necessitates land based support facilities that would be located in the CAFRA area and thus subject to the Coastal Zone Management rules. It is important that these land based facilities be located as

close as possible to the offshore facility, as offshore renewable energy installations and operations cannot be safely and efficiently conducted from a distant port location, since it will involve multiple daily boat trips, which can exceed more than 20 miles offshore. To accomplish these uses, the standards relevant to onshore support bases at N.J.A.C. 7:7E-7.4(e)1 should be amended to include offshore renewable energy facilities and to provide that onshore repair and maintenance facilities to support renewable energy facilities are conditionally acceptable in the CAFRA area provided the onshore facility is located within a previously disturbed port area, and a suitable location outside of the CAFRA area is not available within 10 miles of the closest onshore point to an offshore facility. (28)

RESPONSE: With the exception of N.J.A.C. 7:7E-7.4(b)3, the Energy facility use rule would apply to offshore renewable energy developments located in Federal waters through the Federal consistency provisions of the Federal Coastal Zone Management Act, 16 U.S.C. §§ 1451. Based on discussions with developers currently considering development of offshore wind energy facilities, the Department anticipates that such facilities would be serviced by existing ports. The Department's rules at N.J.A.C. 7:7E-7.9, protect ports and water dependent uses. Therefore, the Department does not believe there is a need to change the rule at this time.

317. COMMENT: The rules will affect the development of offshore wind in Federal waters as a Federal Consistency determination is required from the Department. Because these rules are so concerned with species and habitat protection, objectors to offshore wind will argue that the mere presence of threatened and endangered species is sufficient to challenge Federal permits. (5)

RESPONSE: It is correct that the Coastal Zone Management rules are enforceable policies and therefore used in Federal Consistency reviews. With respect to endangered and threatened wildlife species, the rule does not state that the mere presence of endangered or threatened wildlife species in an area automatically results in denial of a

coastal permit. Rather, the rule provides that development of endangered or threatened wildlife species habitat is prohibited unless it can be demonstrated through an impact assessment that endangered or threatened wildlife species would not directly or through secondary impacts on the relevant site or in the surrounding area be adversely affected.

318. COMMENT: To facilitate the construction of onshore support facilities for offshore renewable energy, the coastal general permit for the construction of support facilities at legally existing and operating marinas at N.J.A.C. 7:7-7.13 should be expanded to include commercial docks and industrial facilities. N.J.A.C. 7:7-7.13(a) should be amended to include a new provision for the construction and operation of onshore repair and maintenance facilities to support renewable energy facilities provided the support facility is located landward of the mean high water line and not located in a wetland area; and the facility shall be located in an existing cleared and maintained area of the site. N.J.A.C. 7:7-7.13(b) should also be amended to provide that the section of the utility line which extends landward from the mean high water line of the tidal water body be no more than 150 feet in length and connect into an existing utility line in the adjacent upland, or extend no more than 150 feet outside of an existing disturbed right-of-way. (28)

RESPONSE: The coastal general permit for the construction of marina support facilities at legally existing and operating marinas at N.J.A.C. 7:7-7.13 addresses support facilities that are common to all commercial marinas. Commercial docks and industrial facilities are too variable and the impacts of such too significant to be reviewed under a coastal general permit. Accordingly, review under an individual coastal permit is appropriate.

319. COMMENT: The proposed rules fail to address the land-side impacts that can be expected for offshore and coastal zone development of wind turbine facilities, including upgrading grid transmission capacity and nearshore electricity transfer stations and identifying locations for onshore staging of construction, operation and maintenance close enough to proposed development sites. Depending on the scale and scope of the

projects individually and cumulatively, the onshore construction and environmental impacts may be significant. How does the Department plan to assess potential impacts and coordinate required land-side permits that are directly related with the types of wind facilities associated with the proposed rules? For example, different construction, operation and maintenance scenarios will have different land-based requirements, (for example ship-based transport will require adequate slip and berthing areas, while helicopter-based support will require airport capacity). What waterfront capacity needs are required for both the demonstration scale and full scale operations? What type of vessels will be used in construction? What type of support is needed while turbines are under construction? What type of operational and maintenance equipment will be required? Will an analysis be required to determine how best to reduce the carbon footprint of operation and maintenance? What are the maritime and traffic implications for full scale, cumulative project? What, if any onshore secondary development will be required (i.e. fueling stations, technical support, supplies, security)?

Does the State plan to identify potential host communities along the coast based on the available electric load-capacity, marina facilities, and appropriate land-side support and maintenance facilities? Have potential host communities been made aware of the scale and scope of required land-based support operation? Do they have concerns or issues that will need to be addressed? All of these secondary impacts must be considered. (50)

RESPONSE: The Department supports the development of renewable energy facilities consistent with protection of natural resources in the coastal zone. Accordingly, applications for wind energy facilities would be required to address all aspects of the development at the time of application, including shoreside facilities, vessel traffic, and secondary impacts. The Board of Public Utilities and PJM Interconnection will participate in the determination of the appropriate connection points into the grid.

As noted previously in response to comment 316, based on discussions with developers currently considering offshore wind energy development, existing port facilities would be used to support the offshore energy development. The Department

does not anticipate it will identify potential host communities to support the development of offshore wind energy facilities. The potential host community would be identified by the applicant for a permit. As part of the application process, public notice would be provided, including to the proposed host community, with an opportunity to raise any concerns with the proposed project.

320. COMMENT: With respect to the Energy Master Plan goals, the proposed rules will have very little impact on the offshore portion of the Energy Master Plan's goals as it is primarily under Federal jurisdiction. (10)

RESPONSE: The Department acknowledges that the majority of offshore wind energy facilities will be located in Federal waters. Where wind energy facilities are located in Federal waters, the Department will continue to work with developers and Federal agencies to meet the goals of New Jersey's Energy Master Plan.

321. COMMENT: Based on these rules, inshore wind energy development is severely restricted. The assumptions made in these rules concerning inshore options are based on little science and may prove fatal. (5)

RESPONSE: The risks to birds and bats associated with the operation of wind turbines is documented in the literature cited in the rule proposal (see 41 N.J.R. 3168(a)). In addition, a list of references used in developing the technical manual and Large Scale Wind Turbine Siting Map report was included in each document. Based on science, the Department believes that Energy Master Plan goal for offshore wind is best met in Federal waters.

CHAPTER 13
FLOOD HAZARD AREA CONTROL ACT RULES

322. COMMENT: The proposed permit-by-rule for wind turbines excludes construction of such structures in floodways. The Department indicates that this exclusion is necessary to protect wind turbines from flood damage and suggests that the placement of fill or structures within floodways obstructs flow and exacerbates nearby flooding conditions. However, the Department does not provide any factual basis to support such statements.

The design and construction techniques for free-standing monopole wind turbines are similar to those of electric power line towers, which the Department has long recognized as the type of structures that do not exacerbate flooding or adversely impact the environment. (See 38 N.J.R. 947 and 949, February 6, 2006). The Flood Hazard Area rules specifically find that such facilities do not obstruct flood flow, reduce the area open to flood waters, or increase flood elevations. (See N.J.A.C. 7:13-1.3(e)1 i-viii (1995)). In fact, the Department has allowed construction of utility towers in floodways, subject to the requirement that such facilities are properly anchored to withstand the corresponding design flood (i.e., a 100-year flood). (See N.J.A.C. 7:13-1.3(e)2viii, 26 N.J.R. 1009, 1021, February 22, 1994; 27 N.J.R. 1211, 1248, March 20, 1995). Aside from inconsistency with prior Department actions, the restrictions on wind turbine development in floodways are inconsistent with other Flood Hazard Area rules that authorize permits-by-rule for many activities in flood hazard areas that also have the potential to obstruct flood flow and displace flood storage, such as building additions and on new buildings. (See N.J.A.C. 7:13-7.2(a)4 and (f)4). Nothing in the record indicates that the Department compared the flood flow obstruction-flood storage displacement potential of wind turbines with other activities in flood hazard areas for which the Department authorizes permits-by-rule and general permits.

It is recognized that the absence of a permit-by-rule or general permit for the construction of wind turbines in the floodway does not preclude the issuance of an individual permit for such structures in floodways. However, the lack of justification for the Department's action does not mitigate the possible alternative of an individual permit. (17)

RESPONSE: The two permits-by-rule referred to by the commenter (N.J.A.C. 7:13-7.2(a)4 for an addition to an existing building and N.J.A.C. 7:13-7.2(f)4 for a building on farmland do require that the building be located outside the floodway. The permit-by-rule proposed under the Flood Hazard Area Control Act rules is specific to small wind turbines. Many of these turbines are built on lattice towers, and in order to streamline their permitting the Department did not specify whether a tower be lattice or monopole. The limitation on construction in the floodway is comparable to that of the permit-by-rule for open-frame towers at N.J.A.C. 7:13-7.2(c)2, which must also be located outside the floodway because of concerns with structural integrity of a tower and potential to obstruct flow.

323. COMMENT: Flood zone area limitations on wind turbines do not seem to recognize standard industry practices that make construction in such areas safe and reliable. In flood prone areas, design and construction of foundations include the application of crushed stone around the foundation. This is an acceptable construction practice which provides adequate protection of structures. (11)

RESPONSE: Flood zone limitations relate to more than protection of the proposed structures themselves. Other concerns include displacing flood storage in the flood fringe, as well as creating obstructions in the floodway, both of which can exacerbate local flooding and cause channel erosion and environmental degradation. The use of gravel for ground cover for such projects does not address such flooding and environmental concerns related to improperly situated above-ground structures.

324. COMMENT: The Flood Hazard Area Control Act rules should include a permit-by-rule for the construction of solar panels. The permit-by-rule should allow the construction of solar panels provided: the panels are not enclosed with walls on any side below the flood hazard area design flood elevation; no disturbance related to the regulated activity is located within 25 feet of any top of bank or edge of water; the panels are on or structurally attached to a legally existing building or utility pole within a

maintained utility right-of-way, or supported solely by a structural steel framework, where the panels are located above the flood plain elevation; no fill is placed in the flood hazard area except for any structural steel framework necessary to support the panels; no vegetation is cleared, cut or removed in a riparian zone, except where previous development or disturbance has occurred; and all vegetated areas temporarily disturbed within the riparian zone are replanted with indigenous, non-invasive species upon completion of the regulated activity.

Further, the Flood Hazard Area Control Act rules should include a permit-by-rule for the construction of solar panels located within flood hazard areas provided the solar panels are located within a previously disturbed flood fringe and/or riparian zone; or the solar panels are located on a Brownfield site which has received either a No Further Action or a Remedial Action Outcome per the Site Remediation Reform Act, and the site is not subject to a previous coastal permit requirement that it remain undeveloped.. In addition to satisfying all the requirements applicable to a general permit at N.J.A.C. 7:13-8.1(b), solar panels would be eligible for this general permit only if the panels: are located in a tidal flood hazard area; meet all CAFRA or waterfront development requirements; and meet the applicable requirements for a structure at N.J.A.C. 7:13-11.4. (28)

RESPONSE: The Flood Hazard Area Control Act rules do contain permits-by-rule that are appropriate for solar panels. For example, the permit-by-rule for the construction of an open structure outside of the floodway at N.J.A.C. 7:13-7.2(b)9 is available for the installation of solar panels in many cases. The criteria listed by the commenter are similar to those of this permit-by-rule, with the exception of the following: “the panels are on or structurally attached to a legally existing building or utility pole within a maintained utility right-of-way, or supported solely by a structural steel framework”. Such activities may be eligible for the permits-by-rule listed at N.J.A.C. 7:13-7.2(b)7, (c) 1 or (c) 2. The permits-by-rule at N.J.A.C. 7:13-7.2(b)7, (b)9 and (c) 2 are not applicable for projects within the floodway because, if placed within a floodway, the support structures could create an obstruction to the flow of water during a flood event, and

thereby exacerbate flooding. Similarly, removing riparian zone vegetation to place solar panels could adversely impact water quality and near-stream habitat. Both the removal of vegetation and the obstruction of flow are relevant concerns regardless of whether a site is disturbed or considered a Brownfield, as such, projects in these areas that do not meet the permit-by-rule criteria require a site specific review under a flood hazard area individual permit to assess the potential impacts to flooding and the environment. However, solar panels placed outside the floodway and within previously-disturbed riparian zones can generally be permitted-by-rule at N.J.A.C. 7:13-7.2(a)2 or (b)9.

325. COMMENT: Proposed N.J.A.C. 7:13-7.2(b)19xii requires that all wires or cables connected to the wind turbine, except for guy wires on turbines 100 feet tall or less, be located underground. The rationale for this provision is that it will minimize disturbance related to the clearing of vegetation and access required for ongoing maintenance. This provision is unjustified. It is assumed that the Department did not intend to apply the requirement for underground lines as broadly as a literal interpretation of the proposed regulation which applies to any cables or wires connected to the wind turbine would suggest. Because the power grid in New Jersey is electrically interconnected within the State and with many other states, literal application of this provision would require retrofitting the entire New Jersey grid with underground lines. Presumably the Department's intent was far narrower and would limit N.J.A.C. 7:13-7.2(b)19xii to cables and wires that connect a new wind turbine to existing transmission lines. (17)

RESPONSE: The Department stated in the proposal summary that N.J.A.C. 7:13-7.2(b)19xii requires all wires and cables connected to the turbine be connected underground, except for guy wires, in order to minimize disturbance related to the clearing of vegetation and access required for ongoing maintenance. This provision applies to the construction of one to three turbines. The Department did not intend to require all New Jersey grid power lines to be located underground. Therefore, the Department is amending N.J.A.C. 7:13-7.2(b)19xii on adoption to clarify that the cables

and wires connecting a new wind turbine to an existing transmission line must be located underground.

326. COMMENT: Underground bulk power transmission lines are frequently not a viable alternative to overhead transmission facilities because underground lines can be difficult and time consuming to repair, which can mean less reliability for the electric power transmission system. A less reliable transmission system will, in turn, mean more risk for consumers and utility ratepayers where prolonged outages are the result, not to mention the higher costs that follow. In addition, even in circumstances where underground power lines are appropriate, certain components such as riser poles, duct system terminal buildings and pad-mounted transformers must be placed above ground, and underground lines, just like their overhead counterparts, require a clear and accessible right-of-way. This reality cuts directly against the Department's rationale for proposed N.J.A.C. 7:13-7.2(b)19xii, that is, to minimize disturbance related to the clearing of vegetation and access required for ongoing maintenance. (See 41 N.J.R. 3180). Finally, the directional drilling that is used to construct underground lines can cause ground features which, in turn, can result in fluids returning to the surface with potential adverse impacts for wetlands and waterways. In short, the proposed requirement for underground lines is unsound and should be eliminated. (17)

RESPONSE: The requirement that wires and cables be placed underground applies only to the flood hazard area permit-by-rule for small wind turbines. These small wind turbines do not require components identified by the commenter and placing the connecting cables underground is a common feature of their construction. Because the Department will not be reviewing these applications, this requirement is necessary to minimize disturbance. If a particular project were not able to meet this requirement, an individual Flood Hazard Area Control Act permit could be applied for.

Comments beyond the scope of the proposal

328. COMMENT: Action should be taken by the Department to retroactively extend the CAFRA center designations that expired, specifically those in Maurice River Township. (42)

Summary of Agency Initiated Changes:

N.J.A.C. 7:7-2.1(b)13ii(4) and 2.3(d)5iv.

The Department proposed that a CAFRA or Waterfront development permit would not be required for the installation of solar panels on sanitary landfills provided the panels were included in the Closure and Post-Closure Care and/or Construction Plan or modified plan as approved by the Department under N.J.A.C. 7:26. The Department is deleting "and/or Construction Plan" as this plan is not required under N.J.A.C. 7:26.

Federal Standards Statement

Executive Order No. 27(1994) and P.L. 1995, c.65 (amending N.J.S.A. 52:14B-1 et seq.) require that State agencies that adopt, readopt, or amend State rules include a statement as to whether the rule contains any standards or requirements that exceed those imposed by Federal law. The adopted permits-by-rule, coastal general permits and rule amendments do not exceed any Federal Standards or requirements under the Federal Coastal Zone Management Act or the Federal Clean Water Act as discussed below.

The Federal Coastal Zone Management Act (P.L. 92-583) was signed into law on October 27, 1972. The Act does not set specific regulatory standards for development in the coastal zone; rather it provides broad guidelines for states developing coastal management programs. The State's Coastal Management Program meets the guidelines established under the Federal Coastal Zone Management Program and the State of New Jersey has obtained approval from the National Oceanic and Atmospheric Administration to implement its program under the Federal Coastal Zone Management Act. These guidelines are found at 15 CFR Part 923. They include the basic components that must be included in a state's coastal zone management plan, including a requirement that the program provide for an orderly process for siting major facilities related to energy

development. However, the federal guidelines do not set forth procedures by which individual activities within a state's coastal zone are to be regulated.

With respect to the permit-by-rule at N.J.A.C. 7:13 – 7.2 adopted herein, the Department's authority for regulating development within flood hazard areas and riparian zones comes solely from State statute, specifically N.J.S.A. 58:16A-50 et seq., 58:10A-1 et seq., and 58:11A-1 et seq. The Flood Hazard rules are not promulgated under the authority of, or in order to implement, comply with, or participate in any program established under Federal law or under a State statute that incorporates or refers to Federal laws, Federal standards or Federal requirements. Therefore, the Department has concluded that the adopted amendments do not exceed these Federal standards or requirements.

Full text of the proposed amendments follows (addition to proposal indicated in boldface with asterisks *__thus*__; deletions from proposal indicated in brackets with asterisks *[thus]*):

CHAPTER 7

COASTAL PERMIT RPOGRAM RULES

7:7-2.1 CAFRA

(b) The Department interprets its obligation and responsibility to regulate development as defined by CAFRA to include review of the potential impacts of any development, if at least part of that development is located within the area in which a CAFRA permit is required. Therefore, if any development requires a CAFRA permit, the Department will review all of the components of the development, not just those that triggered the regulatory thresholds of CAFRA. In addition, the Department will review all the components of a development that spans the zones in (a) above if the total development exceeds a regulatory threshold. The Department interprets the statutory intent as excluding developments with relatively minor impacts. In addition, the repair and maintenance of utilities within rights-of-way on beaches and dunes are not regulated

development as defined at N.J.A.C. 7:7-1.3 provided that all disturbed areas are restored to their pre-disturbance condition. To that end, the following statutory terms are interpreted to mean the following, for the purposes of this section.

1.- 12. (No change.)

13. Development is not the following:

i. (No change from proposal)

ii. The installation of a solar panel(s) provided the solar panel(s) is:

(1) (No change from proposal)

(2) On or structurally attached to a utility pole ***(electric, telephone, cable and lighting)*** within a maintained utility right-of-way ***or on or structurally attached to a parking lot light pole***;

(3) (No change from proposal)

(4) On a sanitary landfill provided the solar panel is included in the Closure and Post-Closure Care *[and/or Construction]* Plan or modified plan as approved by the Department in accordance with N.J.A.C. 7:26.

7:7-2.3 Waterfront Development

(a) – (c) (No change.)

(d) A permit shall be required for the construction, reconstruction, alteration, expansion or enlargement if any structure, or for the excavation or filling of any area, any portion of which is in the waterfront development area as defined in (a) above, with the exceptions listed below:

1. – 4. (No change.)

5. In the waterfront area defined in (a)3 above, the installation of solar panels provided the solar panels are:

i. (No change from proposal.)

ii. On or structurally attached to a utility pole ***(electric, telephone, cable and lighting)*** within a maintained utility right-of-way ***or on or structurally attached to a parking lot light pole*** ;

iii. (No change from proposal)

iv. On a sanitary landfill provided the solar panel is included in the Closure and Post-Closure Care *[and/or Construction]* Plan or modified plan as approved by the Department in accordance with N.J.A.C. 7:26.

6. – 8. (No change.)

(e) –(h) (No change.)

7:7-7.2 Permits-by-rule

(a) This section details the activities authorized by a Permit-by-Rule.

1. – 11. (No change.)

12. The construction of one to three turbines less than 200 feet in height, measured from the ground surface to the tip of the blade at its highest position, and having a cumulative rotor swept area no greater than 2,000 square feet provided:

i. – ii. (No change from proposal.)

iii. The wind turbine(s), including blades, tower and site disturbance, is set back a minimum of 50 feet, as measured parallel to the ground:

(1) Landward of the mean high water line and the inland limit of any beach or dune. This setback does not apply to manmade lagoons ***and manmade ditches***; and

(2) (No change from proposal.)

iv. (No change from proposal.)

v. If the wind turbine(s) is more than *[100]* ***120*** feet tall, measured from the ground surface to the tip of the blade at its highest position, the tower shall be a freestanding monopole(s);

vi. No lighting shall be placed on or directed at the wind turbine except *[that]* ***for lighting required by the Federal Aviation Administration.*** *[shielded]* ***Shielded*** ground level security lighting may be used***. Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light*;** and

vii. (No change from proposal.)

13. (No change from proposal.)

7:7-7.30 Coastal general permit for the construction of one to three wind turbines less than 200 feet in height and having a cumulative rotor swept area no greater than 4,000 square feet

(a) This coastal general permit authorizes the construction of one to three wind turbines less than 200 feet in height, measured from the ground surface to the tip of the blade at its highest position, and having a cumulative rotor swept area no greater than 4,000 square feet provided:

1. – 2. (No change from proposal.)

3. The wind turbine(s), including blades, tower and site disturbance, is set back a minimum of 50 feet, as measured parallel to the ground:

i. Landward of the mean high water line and the inland limit of any beach or dune. This setback does not apply to manmade lagoons ***and manmade ditches***; and

ii. (No change from proposal.)

4. - 5. (No change from proposal.)

6. If the wind turbine(s) is more than *[100]* ***120*** feet tall, measured from the ground surface to the tip of the blade at its highest position, the tower shall be a freestanding monopole(s);

7. No lighting shall be placed on or directed at the wind turbine except *[that]* ***for lighting required by the Federal Aviation Administration.*** *[shielded]* ***Shielded*** ground level security lighting may be used***. Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light***; and

8. (No change from proposal.)

(b) – (c) (No change from proposal.)

7:7-7.31 Coastal general permit for the construction of wind turbines less than 250 feet in height and having a cumulative rotor swept area no greater than 20,000 square feet

(a) This coastal general permit authorizes the construction of wind turbines less than 250 feet in height, measured from the ground surface to the tip of the blade at its highest

position, and having a cumulative rotor swept area no greater than 20,000 square feet provided:

1. – 2. (No change from proposal.)

3. The wind turbine(s), including blades, tower and site disturbance, is set back a minimum of 50 feet, as measured parallel to the ground:

i. Landward of the mean high water line and the inland limit of any beach or dune. This setback does not apply to manmade lagoons ***and manmade ditches***; and

ii. (No change from proposal.)

4. -6. (No change from proposal.)

7. If the wind turbine(s) is more than *[100]* ***120*** feet tall, measured from the ground surface to the tip of the blade at its highest position, the tower should be a freestanding monopole(s);

8. No lighting shall be placed on or directed at the wind turbine except that lighting required by the Federal Aviation Administration and shielded ground level security lighting may be used***. Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light***; and

9. (No change from proposal)

(b) – (c) (No change from proposal)

CHAPTER 7E
COASTAL ZONE MANAGEMENT RULES

SUBCHAPTER 7. USE RULES

7:7E-7.4 Energy facility use rule

(a) (No change.)

(b) Standards relevant to siting of new energy facilities, including all associated development activities, are as follows:

1. -2. (No change.)

3. Notwithstanding (b)2 above, wind and solar energy facilities, including blades, towers and site disturbance shall be sited at least 50 feet inland of the mean high water

line of tidal waters*****, **excluding manmade lagoons and manmade ditches,*** in the areas identified at (b)2i and ii above, except for the following:

i. (No change from proposal)

ii. A wind energy facility that meets (b)3ii(1) and (2) below. The Department shall limit approvals under this subparagraph to ensure that the cumulative number of wind turbines approved does not exceed five, each with a power rating as determined by the manufacturer of five megawatts or less ***or six, each with a power rating as determined by the manufacturer of 4 megawatts or less***. The wind energy facility shall be:

(1) – (2) (No change from proposal.)

4. – 5. (No change.)

(c) – (q) (No change.)

(r) Standards relevant to electric generating stations:

1. New or expanded electric generating facilities (for base load, cycling, or peaking purposes) and related facilities are conditionally acceptable provided:

i.-vi. (No change.)

vii. In order to minimize adverse effects on birds and bats, wind energy facilities located on land shall:

(1) (No change from proposal.)

(2) Have no light(s) placed on or directed at the wind turbine(s), except for lighting required by the Federal Aviation Administration. Shielded ground security lighting may be used***. Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light***;

(3) Use freestanding monopole if the wind turbine is more than *[100]* ***120*** feet tall, measured from the ground surface to the tip of the blade at its highest position. Guy wires or lattice towers are prohibited for a wind turbine more than *[100]* ***120*** feet in height;

(4)- (5) (No change from proposal)

viii. In order to minimize adverse effects on birds, bats, and marine organisms, wind energy facilities located in tidal waters shall:

(1) Have no light(s) placed on the wind turbine(s), except for lighting required by the Federal Aviation Administration and the United States Coast Guard. Shielded ground security lighting may be used***. Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light***;

(2) –(3) (No change from proposal)

2. (No change.)

3. ***The Large Scale Wind Turbine Siting Map identifies areas where large scale wind turbines cannot be constructed in accordance with N.J.A.C. 7:7E-7.4(r)1vii(1) and N.J.A.C. 7:7-7.31 in order to minimize adverse effects on birds and bats.*** The Department may revise the Large Scale Wind Turbine Siting Map based on new information on species occurrence, new information on appropriate buffers, or new information on impacts developed from ongoing monitoring or from published and unpublished studies or data ***[**, in order to minimize adverse effects on birds and bats**]*** as follows:

i. – ii. (No change from Proposal.)

4. (No change.)

(s) (No change.)

CHAPTER 13

FLOOD HAZARD AREA CONTROL ACT RULES

SUBCHAPTER 7. PERMITS-BY-RULE

7:13-7.2 Permits-by-rule

(a) (No change.)

(b) The permit-by-rule at (b)1 through 19 below apply to the specified construction and maintenance activities listed therein.

1. – 18. (No change.)

19. The placement of one to three wind turbines provided:

i. – iv. (No change from proposal.)

v. If the wind turbine(s) is more than *[100]* ***120*** feet tall, measured from the ground surface to the tip of the blade at its highest position, the tower should be a freestanding monopole(s);

vi. No lighting shall be placed on or directed at the wind turbine except *[that]* ***for lighting required by the Federal Aviation Administration.*** *[shielded]* ***Shielded*** ground level security lighting may be used***. Lighting is shielded when it is covered in a way that light rays are not emitted above the horizontal plane of the light***;

vii. – xi. (No change from proposal.)

xii. ***With the exception of guy wires on turbines 120 feet tall or less,***[All]*** ***all*** wires or cables that connect ***[**ed**]*** ***[**to**]*** the wind turbine ***to an existing transmission line****[**, except for guy wires on turbines 100 feet tall or less**]***, are located underground.

(c)-(f) (No change.)