

Adopted August 23, 2019

CMP POLICY & IMPLEMENTATION COMMITTEE MEETING

**Richard J. Sullivan Center
Terrence D. Moore Room
15 C Springfield Road
New Lisbon, New Jersey
July 26, 2019, 2019- 9:30 a.m.**

MINUTES

MEMBERS IN ATTENDANCE: Chairman Richard Prickett, Sean Earlen, Jerome H. Irick, Ed Lloyd, and Mark Lohbauer (via conference call and then in person)

MEMBERS ABSENT: Candace Ashmun and Jordan Howell

STAFF PRESENT: Nancy Wittenberg, Larry L. Liggett, Susan R. Grogan, Paul Leakan, and Betsy Piner. Also in attendance was Craig Ambrose with the Governor's Authorities Unit.

1. Call to Order

Chairman Prickett called the meeting of the Comprehensive Management Plan (CMP) Policy and Implementation (P&I) Committee to order at 9:40 a.m.

2. Pledge Allegiance to the Flag

All present pledged allegiance to the Flag.

3. Adoption of minutes from the June 28, 2019 CMP Policy & Implementation Committee Meeting

Commissioner Earlen moved the adoption of the June 28, 2019 meeting minutes. Commissioner Irick seconded the motion. The minutes were adopted, with all Committee members voting in the affirmative.

4. Executive Director's Report

Monroe Township's 2018 Housing Element and Fair Share Plan and Ordinances O:14-2019, O:16-2019 and O:17-2019, amending Chapter 175 (Land Management) of the Township's Code with respect to affordable housing and adopting revised Redevelopment Plans for the Acme Shopping Center and Williamstown Square Redevelopment Areas

Ms. Grogan said it has been a long process to bring these documents submitted by Monroe Township to the Committee. She said the Township had been working on an affordable housing plan and implementing ordinances as well as its settlement agreement with the Fair Share Housing Center for quite some time. In the interim, there had been an intervener in litigation and

settlements with other parties as well as the Fair Share Housing Center. She said, unfortunately, the Pinelands Commission staff was not made aware of any of these issues until somewhat late in the process. Whereas typically municipalities provide staff with draft copies of their settlement agreements well in advance in order to identify potential issues, this was not the case with Monroe Township. Staff found that the Township had made some significant changes affecting the Pinelands portion of the Township. She said staff identified issues and the Township has been very cooperative in making changes to resolve the problems. But, she said, it has taken a long time and has required her nearly monthly involvement in case management conferences with the judge to make sure that she (the judge) understood Pinelands requirements and that everything remains on track.

In response to a question from Chairman Prickett if the Township were protected from a builders remedy lawsuit during this period, Ms. Grogan said yes, it had been. She said the judge had extended that protection and once the Commission certifies these documents, the judge will schedule a meeting quickly to finalize their approval. She said the judge recognized that the Township has been working in good faith and all parties have been in agreement.

In response to a comment from Commissioner Lloyd, Ms. Grogan agreed that this level of involvement by the Commission is unusual. She said her participation has been by telephone and it has been ongoing for probably a year, which was probably a good thing in resolving any concerns. She said she felt it was important that the Committee be aware of this long, involved process.

Ms. Grogan said Monroe Township had adopted its 2018 Housing Element and Fair Share Plan to implement their settlement agreement. She said the Township has a fairly significant affordable housing obligation and the Plan indicates a rehabilitation obligation of 158 units, a prior round obligation of 439 units, a current round obligation of 400 units and a future round need of zero, the latter being perhaps because they have done a number of affordable housing projects already. She said a significant portion of Monroe is in the Pinelands Area and, unlike many other Pinelands municipalities, the Township has chosen to concentrate its affordable units within the Pinelands Area, in the Regional Growth Area (RGA). She said it was important that staff make sure that requirements such as density and accommodation of Pinelands Development Credits be met.

Ms. Grogan said the Township has established affordable housing set aside requirements that range from 11.11% to 20% depending upon the type of housing and zoning district. She said the Township is also implementing its housing plan through the establishment of two redevelopment areas along the either side of the Black Horse Pike (Route 322). Ordinance O:16-2019 adopts the Acme Shopping Center Redevelopment Plan, 4th Amendment and Ordinance O:17-2019 adopts the Williamstown Square Redevelopment Plan, Amendment #1A.

Mr. Leakan projected Exhibit #2 from the Executive Director's report on the SmartBoard, from which Ms. Grogan identified the Acme Shopping Center Redevelopment Area on the south side of the Black Horse Pike, containing some 51 acres, 30 of which are developed. On this site, the Township has identified the types of mixed uses it wishes to encourage while accommodating, at a minimum, 250 new residential units. She also identified the Williamstown Square Redevelopment Area on the north side of the Black House Pike, a 75-acre nearly vacant tract. She said a previous plan had designated this as an entirely non-residential district while this updated version calls for mixed use with at least 60,000 square feet of non-residential floor area (offices, retail, services, etc.) and a minimum of 350 residential units. The redevelopment plans require that 15% of all units be set aside as affordable units if they are provided as rentals and increases to 20% if they are provided as for sale-units. Ms. Grogan said both redevelopment areas require a 30% PDC obligation for all units, excluding the required affordable housing units.

Ms. Grogan said another component of Monroe's housing plan relates to mobile home parks in the RGA. She said currently the Commission has an application pending for the expansion of a mobile home park. Previously the Township had a 25% PDC requirement for all housing units in that zoning district. Initially, Monroe eliminated the PDC requirement for mobile home parks entirely so staff worked with the Township to facilitate mobile home park development while accommodating the PDC program. As a result, the PDC obligation is now reduced from 25% to 10% , again with the exemption of affordable units; typically this type of housing is built at a density of 7.5-8 units/acre. She said a developer is not required to build the required affordable units on-site; rather, affordable mobile homes must be rehabilitated or constructed in a different mobile home park within the Township's Regional Growth Area. She said overall, the Township and the developers seem pleased with the results, and staff is recommending approval.

Chairman Prickett asked how staff determines the number of PDCs opportunities being provided. Ms. Grogan said staff multiplies the number of units per acre times the number of vacant acres in each zoning district and applies the appropriate percentage according to the PDC obligation. The PDC estimates provided in the Executive Director's report are based on the theoretical maximum number of PDCs required, not detailed site plans.

Ms. Grogan said the traditional approach for PDC use is to provide a base density then add an optional bonus density with the use of PDCs. Since Monroe wants to allow higher densities and exempt affordable units, the mandatory use of PDCs is a means of accommodating what the municipality wants while protecting the PDC program.

In response to Commissioner Irick's question how an increased density would help the environment since it will impact water issues, Ms. Grogan said it would reduce sprawl. She said all these projects are on public sewer and water and the Township has been proactive in terms of planning. She said Monroe has applied for transportation funding through the Pinelands Infrastructure Trust Fund (PITF) program.

In response to Commissioner Lloyd's question if these projects would require clustering, Ms. Grogan said yes, in a manner, because there are no single family detached homes in these redevelopment plans; all are apartments or townhouses.

In response to Commissioner Lloyd's question about the number of mobile home units that have been built, Ms. Grogan said the Commission records how many have been approved but some of them have ten year old approvals with no development yet.

In response to Commissioner Lloyd's question regarding build-out, Ms. Grogan said one can calculate the potential number of units. Mr. Liggett said that based on 2004 vacant land numbers, those calculations were made for all the Pinelands municipalities as part of the Kirkwood/Cohansey (K/C) study. He said Monroe has had a water monitoring program and was forced to buy NJ American water to meet its needs. He added that purchasing additional water will be a political choice.

In response to Chairman Prickett's question regarding water conservation ordinances, Ms. Grogan noted that the Redevelopment Plans encourage the use of green infrastructure, water conservation, Leadership in Energy and Environmental Design (LEED) certification and other measures that are sensitive to the environment. She said staff will be interested in seeing how those measures are accommodated. Ms. Grogan said that if the Commission adopts new regulations for the K/C, water conservation measures will be one of the goals.

In response to Commissioner Irick's question if the large number of units with the associated lawns and landscaping will impact the drawdown of the K/C aquifer, Ms. Grogan said both Redevelopment Areas and the mobile home parks are not places one is likely to see large traditional lawns and landscaped areas. If built as the Redevelopment Plans envision, there will not be a lot of vegetation to be maintained.

Commissioner Lloyd moved the recommendation to the Commission of certification of Monroe Township's 2018 Housing Element and Fair Share Plan and Ordinances O:14-2019, O:16-2019 and O:17-2019. Commissioner Earlen seconded the motion and all voted in favor.

5. Update on solar energy facility rules and applications

Ms. Wittenberg said that at the recent meeting of the Land Use, Climate Impacts and Sustainability Committee, Committee members had discussed solar facilities in the Pinelands, and she felt a discussion at this Committee would be helpful. She said later in the meeting, Ms. Annika Colston, with whom staff has been meeting on various projects, would be providing information.

Ms. Grogan made a presentation on Solar Energy Facilities in the Pinelands (*Attachment A to these minutes and also posted on the Commission's website at:*

[https://www.nj.gov/pinelands/home/presentations/7-26-2019%20solar%20presentation%20\[Read-Only\].pdf](https://www.nj.gov/pinelands/home/presentations/7-26-2019%20solar%20presentation%20[Read-Only].pdf).

Ms. Grogan noted the opening slide was an aerial of the solar panels at the Stafford landfill. She said prior to 2012 solar facilities were allowed in Pinelands Towns, (PT), RGA and perhaps also in Pinelands Villages (PV) and the Rural Development Area (RDA). She reviewed the 2012 CMP amendments related to solar facilities noting that the goals at that time were to speed the development of *accessory* solar facilities through expanded application exemptions and elimination of application fees, and to expand opportunities for larger solar facilities as a *principal* use.

Ms. Grogan said the Commission cannot report on the number of accessory solar facilities in the Pinelands Area because this type of solar facility typically does not require an application to the Commission. Rather, the applicant goes directly to the municipality.

Ms. Grogan said the 2012 amendments added solar new standards for all management areas related to visual impacts, clearing, rights-of-way and decommissioning, while prohibiting off-site infrastructure in the Preservation Area District (PAD), Special Agricultural Production Area (SAPA), and Forest Area, (FA). In the PAD, SAPA and FA, she said, the amendments limit the location of solar facilities as a principal use to closed landfills, hazardous waste sites and resource extraction sites, with a PDC obligation of 0.25 PDCs per acre.

In response to Commissioner Prickett's question as to how to enforce the removal of solar facilities that are no longer in use, Ms. Grogan said there is a similar requirement for cell towers. She added that such monitoring is difficult.

Ms. Grogan said the 2012 amendments allow solar facilities as a principal use in the APA, with a limit of 20% of the parcel to a maximum of ten acres and they must be sited to avoid prime farmland and lands with high ecological value. She said in the RDA, solar facilities as a principal use may be developed on any previously disturbed portion of a parcel, with additional clearing permitted, and they must not exceed 30% of the parcel. The same siting protections for soils apply as for facilities in the APA.

Ms. Grogan said in 2018, the solar rules were updated to reduce the fees, no longer basing them on construction costs, rather a base fee of \$1,500 plus \$500 per acre. She said many Pinelands municipalities permit accessory solar (and wind) facilities but few permit solar as a principal use. Ms. Grogan's presentation further described the type and location of various solar projects and noted that the Commission is seeing an increase in activity, primarily at old landfills.

Ms. Annika Colson, with AC Power, LLC, made a presentation on the New Jersey Community Solar Pilot Program (*Attachment B to these minutes*). She noted that this three-year pilot program is part of Governor Murphy's efforts for New Jersey to achieve 50% renewable energy by 2030. She said Illinois, Minnesota and Massachusetts have similar programs that allow

purchasers of solar energy by non-traditional customers (renters and low-and moderate-income individuals who do not have the opportunity to put solar facilities on their own roofs). She said in year one, the program anticipates the generation of 75 MW of power, divided proportionally among the utility service areas, which, for the Pinelands, is primarily Atlantic City Electric Co. She said the maximum project size will generate five MW of power, which requires roughly 25 acres.

In response to Commissioner Earlen's question as to why there is a maximum project size, Ms. Colston it is to keep the pilot program manageable. She said the program was approved before it was designed, but it will allow for modifications in future years. She said New Jersey needs to evaluate its solar incentive structure and modify the Solar Renewable Energy Credit (SREC) program to keep projects economically attractive.

Commissioner Lohbauer disconnected from the phone call and arrived at the meeting at 10:40 a.m.

Ms. Colson described the project evaluation system that distinguishes this program from those of other states, with priorities placed on low/moderate income subscribers, guaranteed savings and flexible contracts, project siting, level of community engagement, etc. She also showed the color maps identifying the location of acceptable/unacceptable siting areas and the very tight program timeline requiring that approved projects receive all approvals and commence building within six months, with projects online within 12 months of award. She said currently her company has a number of projects in the Pinelands Area.

Commissioner Earlen said there is no way one could meet that permitting process deadline and that he thought those timing obligations would need to be amended.

In response to Commissioner Prickett's question as to who benefits from the program, Ms. Colston said the utility providers will use the power to meet their obligations to provide energy. She said there would be a direct purchase agreement with the end user for these community systems, whereas the landfill projects sell their energy directly to the grid as they have no "neighbors."

In response to Ms. Grogan's question if BPU will try to spread the projects geographically, Ms. Colston said she was unsure but the deadline for submitting applications is September 9, 2019.

In response to Commissioner Earlen's question as to what she saw as hurdles from the Commission, Ms. Colston said managing the timing of the projects. Also she said, there are issues related to cutting trees and a push to relax the rules to allow these projects to proceed. She said there are also concerns related to the need for utilities to upgrade their systems to accommodate increased capacity and issues related to how to verify that customers are indeed low-to-moderate income, as described in Slide 5.

Also, in response to Commissioner Earlen's question if she had overlaid the Pinelands Land Capability Map over her maps, she said, no, but that would be a good idea.

Ms. Wittenberg said the Commission knows that there are limitations and may want to discuss changing the CMP to promote more solar facilities in the Pinelands. She said it will be important to identify those places in advance where such facilities can be built.

Commissioner Lloyd noted that constructing solar facilities on top of existing warehouses is being proposed in North Jersey. He asked whether staff could estimate the square footage of such roof tops in the Pinelands Area. Ms. Grogan said it might be interesting to look at a couple of municipalities for that information; however, the number of warehouses in the Pinelands Area is quite small.

In response to Commissioner Earlen's question about denying clear-cutting for solar projects that would have otherwise been approved for development, Ms. Wittenberg said that staff hears that concern frequently. She said applicants were puzzled that land can be cleared to build a house but not to install solar facilities.

Chairman Prickett said maybe a portion of a lot could be cleared for solar and the remainder deed restricted.

Commissioner Irick said he thought solar was a good trade-off for homes.

Commissioner Lloyd said solar is a better at dealing with carbon emissions than trees, but trees have other values.

Commissioner Earlen suggested that a list of solar topics be developed for the next meeting.

6. Public Comment

Mr. Rich Bizub, with the Pinelands Preservation Alliance (PPA), distributed documents related to soil and groundwater contamination in the vicinity of Joint Base McGuire-Dix-Lakehurst caused by perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), chemicals released from firefighting foam (*see Attachment C to these minutes*). He said these chemicals are a threat to human health and the environment, and currently there is no funding to conduct a Remedial Investigation that leads to the eventual cleanup of contaminated soil and water. He said this could be an issue for the Commission's Science Office to research.

Commissioner Lloyd said six companies are the primary generators of these chemicals and will fund the cleanup. He said perhaps this could be a source of funding for a Science Office project.

In response to Chairman Prickett's question as to how these compounds can be removed, Mr. Bizub said activated carbon will remove them from water, but it is much more difficult to treat

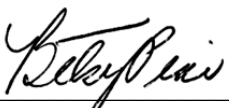
soil because it needs to be removed from the site. He said human health issues have been associated with these chemicals at very low levels, even down to parts per trillion.

Mr. Jay Mounier, a resident of Franklin Township, referenced the discussion of solar projects and how the proliferation of many small solar systems could make a large contribution to power needs. He said one needed to consider how to handle the destabilization of the grid caused by intermittent power sources due to day and night fluctuations. He said such entities as PJM (*a regional transmission organization*) and the Board of Public Utilities are involved in keeping the power supply stable and available but they may put a cap on the amount of solar power that can be generated in the Pinelands. He said wind is not an issue in the Pinelands. He advised the Commission to proceed with caution when discussing renewable energy sources.

Commissioners Lohbauer and Prickett commented on the success of the Short Course and thanked Mr. Leakan for his efforts.

There being no other items of interest, the meeting adjourned at 11:48 a.m. (moved by Commissioner Lohbauer and seconded by Commissioner Earlen).

Certified as true and correct:



Betsy Piner,
Principal Planning Assistant

Date: August 8, 2019



Solar Energy Facility Regulations

- Pre-2012 CMP
- 2012 CMP Amendments
- 2018 CMP Amendments



Above: Solar panel carports were installed above the parking lots at Stockton University in Galloway Township.

2012 CMP Amendments

Primary goals:

- Speed development of **accessory** solar facilities through expanded application exemptions and elimination of application fees
- Expand opportunities for development of large solar facilities as a **principal** use, recognizing the continued need to preserve ecological and agricultural resources

2012 CMP Amendments Solar as an Accessory Use

Added new exemption for solar facilities located on existing structures or impervious surfaces



Above: Solar panels in Pemberton Township.

2012 CMP Amendments Solar as a Principal Use

New standards added for all management areas:

- Prohibit off-site infrastructure in the PAD, SAPA and FA
- Locate and screen facilities so as to minimize visual impacts from scenic corridors, roads, houses, campgrounds, etc.
- Limit clearing to the minimum necessary
- Limit new rights-of-way to 20 feet in width
- Decommission (remove) facilities within one year if no longer used

2012 CMP Amendments PAD, SAPA and Forest Area

- Solar facilities as a **principal use** are limited to:
 - Closed landfills
 - Hazardous waste sites
 - Resource extraction sites
- Solar facilities must be located on:
 - previously disturbed lands where restoration has not occurred and is not required by the CMP
 - Undisturbed lands where disturbance is required for landfill closure or site remediation
- PDC requirements apply (one right per 4 acres)

2012 CMP Amendments Agricultural Production Area

- Solar facilities as a **principal use** are limited to 20% of a parcel (10 acre maximum)
- Facilities must be sited to avoid prime farmland and lands with high ecological values

2012 CMP Amendments Rural Development Area

- Solar facilities as a **principal use** may be developed on any previously disturbed portions of a parcel
- Additional clearing is permitted, not to exceed 30% of a parcel
- Facilities must be sited to avoid prime farmland and lands with high ecological values

2018 CMP Amendments

- Significant reduction in application fees for solar energy facilities
 - Old: % of construction costs
 - 3 acre solar facility = \$10,000
 - New: \$1,500 plus \$500 per acre
 - 3 acre solar facility = \$3,000

Municipal Ordinance Activity

- The CMP does not require that municipalities permit solar energy facilities
- Many municipalities have elected to permit **accessory** solar (and wind) facilities
- Few municipalities have chosen to permit solar facilities as a **principal use** in the Pinelands Area:
 - Pemberton
 - Shamong
 - Southampton
 - Waterford
 - Egg Harbor Township (in process)

Application Activity: Accessory Solar Facilities

- Exempt
 - Accessory to agriculture
 - Accessory to a single-family dwelling
 - Located on existing structure or impervious surface



Application Activity: Accessory Solar Facilities

- Ground-mounted accessory facilities (2-7 acres)
 - Atlantic Cape Community College
 - Stockton University
 - Hammonton and BBMUA WWTPs
 - CHOP
 - Renault Winery
 - AC Airport
 - WaWa
 - Schools, churches, resource extraction sites, farms

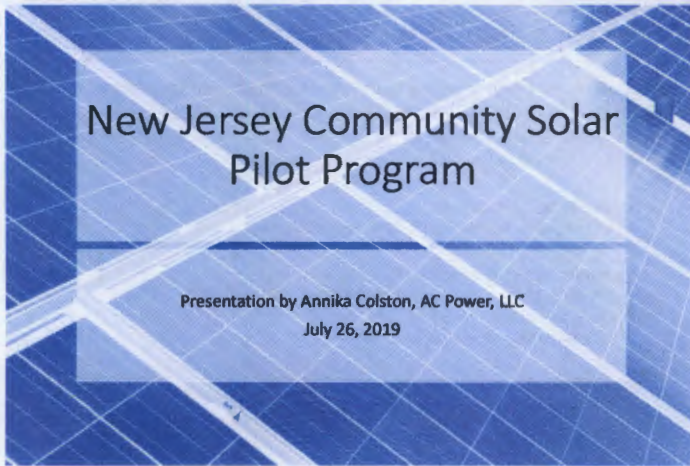
Application Activity: Principal Solar Facilities

Municipality	Management Area	MW	Acres	Location
Egg Harbor	RGA	4.64	13.2	Landfill
Evesham	RDA	6.50	22	Landfill
Galloway	APA	1.0	6	Farm
Hamilton and Egg Harbor	RGA	3.9	14.1	LNG facility/ compressor station
Jackson	RDA	4.0	13.7	Landfill

Application Activity: Principal Use

Municipality	Management Area	MW	Acres	Location
Manchester	Military	13.0	56	Joint Base
Pemberton	Military	20.0	50	Landfill at Joint Base
Shamong	FA/RDA	3.0	30	Landfill
Stafford	RGA	6.0	30	Landfill
Winslow	RDA	2.25	7	Landfill





AC POWER

Program Goals and Design

- Part of Gov. Murphy's platform to achieve 50% renewable energy by 2030
- Provides a means of solar access to non-traditional customers, including renters and Low- and Moderate-Income individuals
- Unique project evaluation system allows it to prioritize certain types of development, and sets it apart from other states

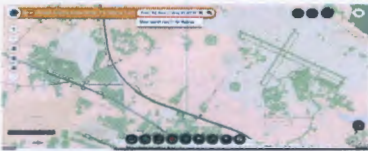
Program at a Glance	
Total Years	3
Year 1 Capacity	75 MW, divided proportionally by utility service area
Maximum Project Size	5 MW
Credits	Retail rate
Priorities: Subscribers	LMI projects (30 pts); residential (10 pts)
Priorities: Product Offering	Guaranteed savings; flexible contracts (15 pts)
Priorities: Siting	Landfill, brownfield, rooftop, historic fill, and parking (20 pts); land enhancement (5 bonus pts)
Priorities: Community	Community engagement (10 pts); local workers (10 pts); limited subscriber geography (5 pts)
Application Deadline	September 9, 2019

AC POWER

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Application Tools

- NJ Community Solar PV Siting Tool - <https://www.nj.gov/dep/ages/solar-siting.html>



- EDC Interconnection Capacity - ACE - <https://www.atlanticcityelectric.com/MyAccount/MyService/Pages/Hosting-Capacity-Map.aspx>

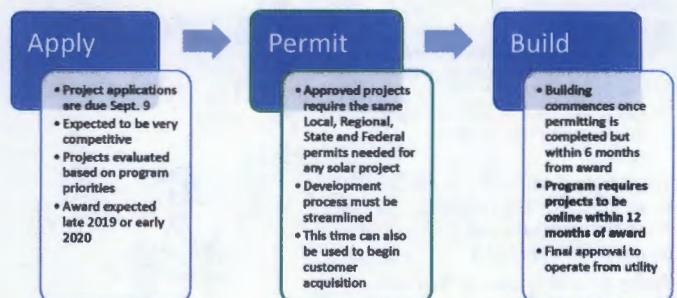


AC POWER

Business Confidential

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Program Timeline



AC POWER

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Potential Challenges

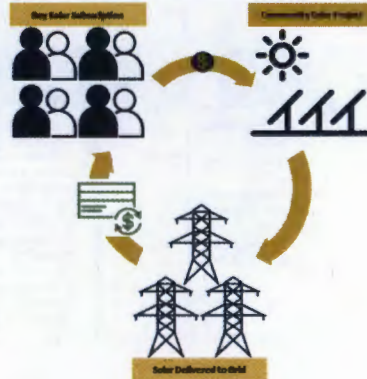
- **Permitting**
 - Upon approval in the program, each project must be permitted, constructed, and operable within 12 months. Errors in applications to the Pinelands Commission, NJDEP, or Townships can result in months of delay in the development process. Communication of requirements of each application is vital to getting a project online on time.
 - Townships require a Certificate of Filing to be issued by the Pinelands Commission prior to scheduling a project for Planning or Zoning Board review. Often Planning and Zoning Boards only meet once or twice a month, resulting in further delays.
- **Interconnection**
 - Applications are required to include an indication of available capacity, but this may not reflect capacity changes due to substation upgrades or competition from other projects in the program
 - No proposed framework for utilities to expedite the interconnection process for approved projects within the required 12 month timeframe
- **Low- and Moderate-Income Subscriber Verification and Recruitment**
 - It is still unclear how LMI status will be verified, but many common practices, including requiring tax returns or pay stubs can create significant barriers to participation
 - Many LMI communities have been taken advantage of by predatory retail energy suppliers, and it will be a challenge to convince these communities that community solar is different and to build their trust in the program
- **Competition and Raising Expectations**
 - Pilot program limits participation so unlikely all applications will be approved
 - Completing an application is time consuming and requires outreach to the community in order to get their "buy-in". There is a risk that a project will raise expectations only to have the project not approved.

AC Power's Pinelands Projects

- AC Power is currently working to develop 4 Community Solar projects within the Pinelands, with several more possible for 2020
 - Aero Haven Solar – Evesham, NJ
 - 6.5 MW project on closed landfill owned by Owens Corning
 - Pettinos Solar – Winslow, NJ
 - 1.6 MW project on closed landfill owned by Owens Corning
 - Egg Harbor Solar – Egg Harbor, NJ
 - 2.5 MW project on closed landfill owned by Robert T. Winstinger, Inc.
 - Located in a NJ Opportunity Zone
 - Potential for expansion of project up to 10 MW
 - Haas Tabernacle Solar – Tabernacle, NJ
 - 3.0 MW project on former sand and gravel quarry

Summary

- The Community Solar Program offers benefits to consumers and developers:
 - Consumers receive clean energy and a guaranteed discount on their electric bill
 - Developers receive retail rate credit for the energy their projects generate
- The standard permitting process is not affected, so all projects must be technically and environmentally sound
- There are still challenges that will need to be solved





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Joint Base McGuire-Dix-Lakehurst

Groundwater Contamination

The Joint Base McGuire-Dix-Lakehurst (JBMDL) is located in Burlington and Ocean Counties and spans approximately 20 square miles. The base is located almost entirely in the Pinelands National Reserve. Perfluorooctanoic Acid (PFOA) and perfluorooctanesulfonic acid (PFOS) have received much attention in the area lately because they have been found in drinking water on the base and in private wells outside the base. PFOA and PFOS are a subset of perfluoroalkyl and polyfluorinated substances (PFAS) that have been found to pose serious health threats to humans. The source of these two compounds is primarily from the use of aqueous film-forming foam for training exercises and to extinguish actual fires.

Drinking Water Contamination

JBMDL supports over 42,000 people who live or work at or near the base. Two wells within the base drinking water system were found to have combined levels of PFOA and PFOS of 215 parts per trillion (ppt), which exceeds the federal Environmental Protection Agency (EPA) health advisory of 70 ppt. Near the base approximately 190 individual wells have been tested with five wells exceeding the EPA health advisory. These wells required that treatment systems be installed to meet the 70 ppt health advisory. Recently, the EPA health advisory has come into question as not being protective of human health. The New Jersey Drinking Water Quality Institute (DWQI) has recommended that the New Jersey Department of Environmental Protection (Department) propose and adopt a maximum contaminant level (MCL) of 14 ppt for PFOA in drinking water.^{1,2} In addition, the DWQI has recommended an MCL of 13 ppt for PFOS.^{3,4} The Department is currently in a rulemaking process to adopt groundwater quality standards for PFOA and PFOS, and the recommendations by the DWQI. It is unclear how many of the 190 offsite drinking water wells are below the EPA health advisory, but exceed the proposed health based water quality standards for PFOA and PFOS.

Extensive Groundwater Contamination

In southern New Jersey, the shallow Kirkwood-Cohansey aquifer provides over ninety (90) percent of water as baseflow to streams, rivers and associated wetlands. The shallow aquifer and surface waters of this part of the State are therefore, inextricably interconnected. Protecting this aquifer system from PFOA and PFOS, and remediating the aquifer once these organic compounds have been detected is vital to protecting human health and maintaining the integrity of the environment.

¹ *Maximum Contaminant Level Recommendation for Perfluorooctanoic Acid in Drinking Water, Basis and Background*, New Jersey Drinking Water Quality Institute, March 15, 2017

² *Health-Based Maximum Contaminant Level Support Document: Perfluorooctanoic Acid (PFOA)*, New Jersey Drinking Water Quality Institute, February 15, 2017

³ *Maximum Contaminant Level Recommendation for Perfluorooctane Sulfonate in Drinking Water: Basis and Background*, New Jersey Drinking Water Quality Institute, June 8, 2018

⁴ *Health-Based Maximum Contaminant Level Support Document: Perfluorooctane Sulfonate (PFOS)*, New Jersey Drinking Water Quality Institute, June 5, 2018

In an effort to determine the extent of PFOA/PFOS contamination, JBMDL conducted a basewide sampling effort in 2016 focusing on 21 areas of concern. Approximately 160 groundwater samples were collected from the shallow aquifer. Of these samples, 140 exceeded proposed groundwater quality standards for either PFOA or PFOS.⁵ Concentrations as high as 23,000 ppt for PFOA and 260,000 ppt for PFOS were documented. Based on the results of this sampling, it is clear that groundwater contamination on the base is widespread.

Extensive Surface Water Contamination

The problem of PFOA and PFOS contamination is not just restricted to groundwater on and immediately adjacent to the base. The Department in 2018 performed a statewide assessment of PFAS compounds at 11 waterways.⁶ Surface water, sediment, and fish tissue samples were collected at sites along these waterways. Of the waterways sampled, the highest concentrations of PFAS compounds were found in surface water and sediment associated with water bodies near the Joint Base.

The assessment also confirmed that PFOA and PFOS contamination is present in waters that drain to the west into the Delaware River Watershed and to the east into the Barnegat Bay Watershed. The contamination from JBMDL is therefore massive and is degrading lakes and streams in the Pinelands National Reserve.

Fish Contamination

Of the waterways sampled in the Departments statewide assessment of PFAS, the highest concentrations of PFAS compounds were found in fish associated with water bodies near the Joint Base. As a result, the Department issued specific fish advisories for water bodies near the base. The problem was of such a concern that the Department issued fish advisory's of "Do Not Eat" or "Eat Only One" fish per year for waters of the Pinelands adjacent to the base.

No Plans for Soil or Groundwater Cleanup

As previously stated, during fire training exercises aqueous film-forming foam would be used to extinguish fires. As a result of decades of fire fighting foam usage, PFOA and PFOS has seeped into the soil. These soils continue to act as the source of PFOA and PFOS contamination to the ground water since no soil cleanup has been conducted to date, and no soil clean up is planned.

Action Needed

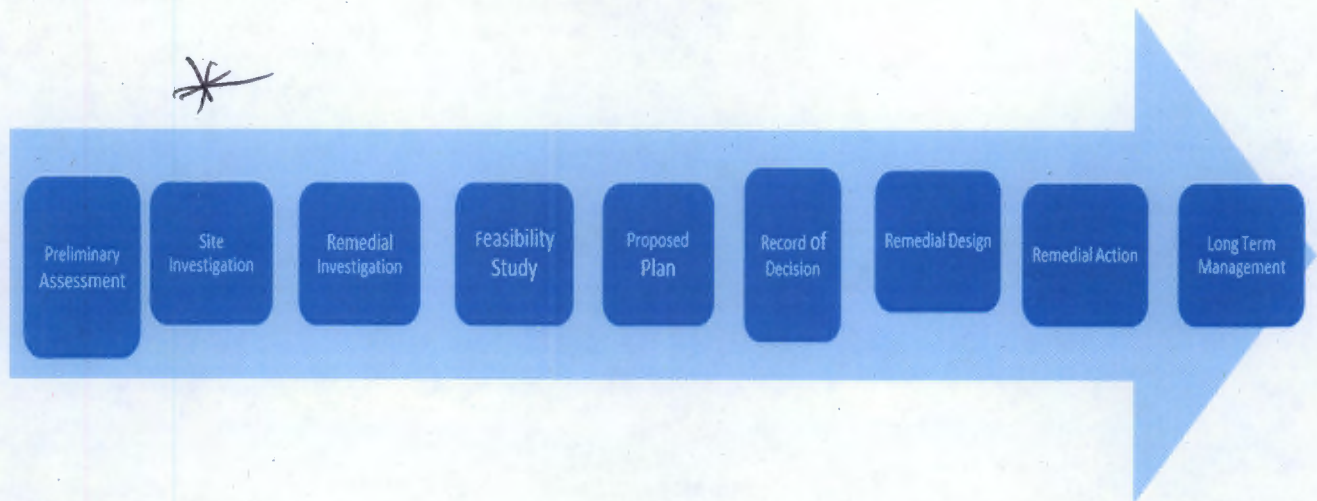
The recently completed Site Inspection report is only the second step in an eight step process to actually cleaning up contaminated soils. These soils will continue to contaminate groundwater, drinking water, and fish until they are removed. Currently there is *No* funding available to conduct a Remedial Investigation (RI). The RI is a detailed investigation of PFOA/PFOS sites and is the next step in the process leading to eventual cleanup of soil and groundwater at the Joint Base. What is needed now is additional funding to conduct the RI, or the reallocation of dedicated funds within the base environmental restoration program to perform the RI.

⁵ *Final Site Inspections Report of Fire Fighting Foam Usage at Joint Base McGuire-Dix-Lakehurst Burlington and Ocean Counties, New Jersey*, U.S. Army Corps of Engineers, January 2019

⁶ *Investigation of Levels of Perfluorinated Compounds in New Jersey Fish, Surface Water, and Sediment*, New Jersey Department of Environmental Protection, June 18, 2018 (updated April 9, 2019)

Joint Base McGuire-Dix-Lakehurst

Environmental Cleanup Process



Investigation of Levels of Perfluorinated Compounds in New Jersey Fish, Surface Water, and Sediment

New Jersey Department of Environmental Protection
Division of Science, Research, and Environmental Health

SR15-010

June 18, 2018

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Executive Summary

Per- and polyfluorinated substances (PFAS) are used in the manufacture of useful products that impart stain resistance, water resistance, heat resistance and other desirable properties. PFAS are also used in various Aqueous Film Forming Foams (AFFF) that are used in fire-fighting. These substances are in wide use today, found at industrial sites that use or manufacture them and at military bases, airports and other areas known for fire-fighting activities. A subset of PFAS, perfluorinated compounds (PFCs), have fully fluorinated carbon chains as their backbone, and their extremely strong carbon-fluorine bonds makes them very resistant to degradation. When released to the environment, PFCs persist indefinitely and can travel distances from their source in surface water, groundwater, or in the atmosphere. PFAS are considered "emerging contaminants" because additional information on their presence and toxicity to ecosystems and humans continues to become available.

The Division of Science, Research and Environmental Health (DSREH) performed an initial assessment of 13 PFAS, all of which are perfluorinated compounds (PFCs), at 11 waterways across the state. Fourteen surface water and sediment samples and 94 fish tissue samples were collected at sites along these waterways. The sites were selected based on their proximity to potential sources of PFAS and their likelihood of being used for recreational and fishing purposes. The sampling sites are located within Passaic, Middlesex, Ocean, Burlington, Gloucester, and Salem Counties.

All surface water samples contained detectable levels of at least four PFAS. The lowest total PFAS in surface water was in the Cohansey River, with Horicon Lake and Echo Lake having the second and third lowest total PFAS, respectively. The highest total level of PFAS was found in Little Pine Lake, near the Joint Base McGuire-Dix-Lakehurst, with Mirror Lake and Pine Lake ranking the second and third highest, respectively. Consistent with the known characteristics of preferential partitioning of longer chain PFCs to sediment and shorter chain PFCs to the water column, the PFAS detected in surface water were those with a carbon chain length of nine carbons or less.

Ten of the 14 sites where sediment samples were collected had detectable levels of at least one, and up to eight, PFAS. Little Pine Lake had the highest total PFAS concentration (30.93 ng/g) in the sediment, with the majority being perfluorooctane sulfonate (PFOS), the eight-carbon chain sulfonate. Echo Lake (West Milford in Passaic County), often used as a New Jersey "background" site, had no detectable levels of PFAS in the sediment. All detectable PFAS in the sediment were compounds with six or more carbons (i.e. PFHxS and longer carbon chain length).

One to three individual fish from two to four species (three each of three species at most sites) were collected and analyzed at each site. The average detectable concentrations (non-detects were not included in the averaging of the tissue concentrations) of the individual PFAS showed that all species at all sites were impacted by one or more PFAS compounds. These contaminants are "proteinophilic" (e.g. bind to muscle tissue in the fillets) and do not bioaccumulate in the fatty tissue like other persistent organic pollutants frequently found in fish (e.g. PCBs, dioxins). In general, the sites with identified sources and detectable levels of PFAS in surface water and

sediment had higher levels of PFAS in the fish tissue, with the samples from Pine Lake and Little Pine Lake having the highest detected concentrations.

This report includes preliminary fish consumption advisories for three PFAS – PFNA, PFOA and PFOS - based on current New Jersey Reference Doses established for each of these compounds. While these preliminary advisories provide the reader with an early indication of potential outcomes, it is emphasized that the advisories have not been finalized as of this writing and should only be viewed as potential benchmarks for evaluating the data. Based on the preliminary advisories, all of the 11 sites would have some level of fish consumption guidance ranging from “one meal per week” to “do not eat”.

Five sampling locations in Central New Jersey (Figure 2):

4. Metedeconk River 1 and 2 (the impoundment known as Forge Pond, and upstream Metedeconk River in Ocean County)
5. Pine Lake (impoundment on the Ridgeway tributary to the Toms River in eastern Manchester, Ocean County)
6. Horicon Lake (upstream of a tributary to Pine Lake, located south of eastern boundary of Joint Base McGuire-Dix-Lakehurst [JB MDL])
7. Little Pine Lake (impoundment upstream of Mirror Lake on a tributary to the Rancocas Creek, just south of the western boundary of the JB MDL)
8. Mirror Lake (an impoundment of a tributary to the Rancocas, slightly southeast of the western boundary of the JB MDL)



Figure 2: Five Sampling Sites in Central New Jersey