



Application for Section 319 Non Point Source Pollution Control Grant---FY2008

Division of Water Quality
North Carolina Department of Environment and Natural Resources

1. Project Title	The Lower White Oak River Water Quality Improvement Project
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2. Sponsor	
Organization Name	Town of Cedar Point
E-mail address	
Mailing Address	P.O. Box 1687
City	Cedar Point State <u>NC</u> Zip <u>28584</u>
Telephone	252-393-2753 Fax Number <u>252-393-7166</u>
Federal Tax ID Number	56-1633966

3. Project Coordinator or Primary Contact¹	
Name	Christopher Seaberg
Title	Town Manager
E-mail Address	cdseaberg@cedarpointnc.org
Mailing Address	P.O. Box 1687
City	Cedar Point State <u>NC</u> Zip <u>28584</u>
Telephone (if different from above)	Fax Number (if different from above)

¹ A one-page Statement of Qualifications must accompany applications to confirm that anyone designing, installing, or monitoring the proposed project is qualified to do so. Include in the statement any past and/or ongoing 319 grant funded projects.

Total Section 319 Funds Requested	\$133,049	5. Type of Funding Requested (check one)	Competitive Base	Restoration (Incremental)
				X
Match funds or in-kind Match Services	\$94,030	6. Type of Project (check one)		Development or implementation of a Watershed Restoration Plan
			X	Development or implementation of a TMDL
4. Total Project Cost	\$227,079		X	Innovative BMP Technology Demonstration
			X	Education/Technology Transfer
		X	Other: ordinance creation	

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7. General Goal of Project <i>(Check all that apply)</i>	Protect and/or Maintain Water Resource Quality	Restore Water Resource Quality	Educate	
		X	X	
8. Project Start Date	October 2008	Project End Date	September 2010	
9. Geographic Coverage	Statewide	Regional	Watershed	Site Specific
			X	

10. Project Location	
River Basin	White Oak
Watershed(s)	Boathouse Creek, Dubling Creek, southeastern White Oak River, Deer Creek, western Bogue Sound
Watershed size	4.2 square miles
303(d) listed Stream	Yes x No
303 (d) list number Stream Reach Code	Boathouse Creek (20-31), Dubling Creek (20-30), lower White Oak (20-[18]d), Deer Creek (20-36-1), and western Bogue Sound (20-36-[0.5]a2, 20-36-[0.5]a3, 20-36-[0.5]a4, 20-36-[0.5]a5, 20-36-[0.5]a6, 20-36-[0.5]b1, 20-36-[0.5]b2)
HUC(s) (14 digit USGS Hydrologic Unit Codes)	03020106020030
County	Carteret
USGS. 7.5 minute topographic quadrangle map(s) in project area	Swansboro
Position coordinates of project location	Latitude 77.095 W Longitude 34.684 N

11. NPS Pollution Sources to be addressed (Check all that apply)			
	Agriculture		Waste Disposal (includes onsite systems)
	Construction		Hydrologic Modification
	Silviculture		Marina and Recreational Boating
x	Urban runoff/Stormwater		Groundwater Loading
	Resource Extraction	x	Natural Sources
	Habitat Modification (drainage/filling wetlands, streambank destabilization)		Other:

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12. NPS Pollutants to be addressed (check all that apply)			
	Excess Nitrogen		Pesticides
	Excess Phosphorus		Oil and grease
	Sedimentation		Temperature
x	Pathogens/Bacteria		pH
	Metals		Alterations
	Low dissolved oxygen		Other:

12a. Estimate Load Reduction, if checked for excess nitrogen, excess phosphorus and/or sedimentation	
# pounds of nitrogen saved from project implementation	Reference:
# pounds of phosphorus saved from project implementation	Reference:
# tons of soil saved from project implementation	Reference:
Load Reduction Model Used: STEPL, Region 5, L-THIA, Other	

13. Project Abstract (short concise summary of the project – DO NOT EXPAND SPACE PROVIDED)

The primary goals of the project are to help the town of Cedar Point develop the tools it needs to meet the limits of a TMDL being devised under a 319-funded project now underway in four small, impaired watersheds in the White Oak River in Carteret County, N.C., and to devise a workable strategy for maintaining and restoring water quality and aquatic resources in the watersheds. The grant would fund a three-pronged approach to help reach those goals: community outreach and education, inexpensive retrofit Best Management Practices (BMPs) in a targeted watershed, and a model stormwater ordinance for Low Impact Development (LID) practices. The neighboring town of Cape Carteret, a project partner, will join us in developing the LID ordinance that could then be adopted in that town as well. Our intent is that the ordinances have broader applicability for other small coastal towns that are struggling to balance economic growth and environmental protection. To help reach that goal, the project will also provide training to local government officials in the surrounding area on devising an LID stormwater ordinance. The BMP projects will include a “green” design of Cedar Point’s town hall complex to reduce stormwater flows, a program at a public park to educate people about the effects of pet waste on water quality and LID projects on a lot or neighborhood scale. The projects will be chosen from a list of retrofit BMPs that the current TMDL project will recommend. The money set aside for these projects will likely be leveraged to attract money from a state program for LID retrofits.

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17. Project Partners (may add more, if needed)²			
Agency Name	N.C. Coastal Federation		
Agency Address	3609 Highway 24, Newport, NC		
Role/contribution to Project	Provide outreach and communications services to the town, as well as financial tracking and grant reporting services.		
Contact Person	Frank Tursi	Phone No.	252-393-8185
E-mail address	lookoutkeeper@nccoast.org		
Agency Name	Town of Cape Carteret		
Agency Address	102 Dolphin St., Cape Carteret, NC 28584		
Role/contribution to Project	Partner in developing local stormwater LID ordinance		
Contact Person	David Rief	Phone No.	252-393-7901
E-mail address	inspections@townofcapecarteret.com		
Agency Name	Carteret County Parks and Recreation Department		
Agency Address	801 Arendell Ave. Suite 8, Morehead City, NC 28557		
Role/contribution to Project	Partner in pet waste removal in Western Park		
Contact Person	Deborah Pasteur	Phone No.	252-808-3301
E-mail address	dpasteur@carteretcountygov.org		
Agency Name			
Agency Address			
Role/contribution to Project			
Contact Person		Phone No.	
E-mail address			

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18. Project Milestone Schedule		
Time Period/Date	Activities (List specific quantifiable outputs or activities that will be achieved during each quarter)	Anticipated % of Requested Funding Spent ¹
First Quarter	<ol style="list-style-type: none"> 1. Cedar Point and Cape Carteret planning boards and/or town boards appoint members of project review team (PRT) and Technical Review Team (TRT). 2. First PRT team meeting. 3. TRT meets with consultants to begin developing LID ordinance, BMP manual and permit modeling tool. 4. First press releases. 5. Consultations begin with architects, engineers on LID design and retrofit at Cedar Point Town Hall. 6. Town Hall site plan developed. 7. Process developed for neighborhood LID BMPs. 	20%
Second Quarter	<ol style="list-style-type: none"> 1. PRT meets. 2. Town hall site plan completed and approved by Cedar Point Town Council. 3. Construction of town hall retrofit begins. 4. Development of signs, educational material for town hall LID begins. 5. TRT meets with consultants. 6. Web page developed and online. 7. Press releases as needed. 	20%
Third Quarter	<ol style="list-style-type: none"> 1. PRT meets. 2. Town hall retrofit, signage completed 3. Monitoring of town hall retrofit begins. 4. TRT continues work on LID ordinance, reports progress to Cedar Point, Cape Carteret town councils. 5. First LID workshop for local government officials. 6. Press releases as necessary, website updated. 7. First neighborhood LID BMPs installed 	10%
Fourth Quarter	<ol style="list-style-type: none"> 1. PRT meets. 2. TRT presents draft ordinance to Cedar Point, Cape Carteret town councils. 3. Monitoring of town hall retrofit completed. 4. Neighborhood LID BMPs installed. 5. Development of BMP atlas begins. 6. Press release, website update as needed. 	10%
Fifth Quarter	<ol style="list-style-type: none"> 1. PRT meets. 2. Second public meeting of local government officials 3. TRT presents final LID ordinance to town councils. 4. Training workshop on modeling tool for Cedar Point, Cape Carteret officials. 5. Neighborhood LID BMPs installed. 	10%

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	6. Press releases, web update as necessary.	
Sixth Quarter	<ol style="list-style-type: none"> 1. PRT meets. 2. Western Park pet program developed. 3. Neighborhood LID BMPs projects installed. 4. BMP atlas completed. 5. Press releases, web update as necessary. 	10%
Seventh Quarter	<ol style="list-style-type: none"> 1. PRT meets. 2. Final workshop and field trip for local government officials. 3. Pet programs starts at Western Park. 4. Final neighborhood LID BMP projects installed. 5. Press releases, web update as necessary. 6. Public workshop and field trip. 	10%
Eighth Quarter	<ol style="list-style-type: none"> 1. PRT meets for last time. 2. Press releases, web update as necessary. 3. Project Final Report. 	10%
Ninth Quarter		
Tenth Quarter		
Eleventh Quarter ²		
Twelfth Quarter		

¹ Please show anticipated dollar amount, percent of grant spent that quarter, and cumulative percent of grant spent for project. Quarterly invoices will only be reimbursed up to percent indicated. Unused funds will carry forward to next quarter.

² 10% of grant will be held until receipt of Final Project Report

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19. Background and goals of the project. Expand space, if necessary

Cedar Point, with a population of about 1,000, is a small town in western Carteret County that has seen its permanent population double since 1990. Its seasonal population more than triples. As in many small, rapidly growing coastal towns, land uses are changing quickly from rural to more urban environments. In fact, Cedar Point is the only place in Carteret's planning jurisdiction that is considered "urban" in the county's CAMA land-use plan. New subdivisions and shopping centers and increased commercial and light industrial development have significantly modified the hydrology of the watersheds in Cedar Point, which is on a peninsula and is surrounded by designated shellfish waters. With more impervious surfaces, ditches, culverts and managed yards, stormwater runoff now efficiently delivers fecal coliform bacteria from wildlife, pets and humans to the surrounding water bodies, particularly the White Oak River. Because of the increase in fecal coliform bacteria, DEH Shellfish Sanitation has had to permanently close more shellfish waters or temporarily close others more frequently. Currently, more than 2,200 acres, or almost two-thirds of the designated shellfishing waters of the lower White Oak River, are considered impaired because of bacteria contamination and are listed on the state's draft 2008 303(d) list.

In response to this problem, the N.C. Coastal Federation (NCCF) and the Town of Cedar Point formed a partnership and received a 319 grant in 2006 to devise watershed implementation plans and TMDLs for three watersheds in the lower White Oak. They've collected more than 200 water samples. Almost 90 percent exceed the federal bacteria standard for shellfish waters. Many samples were hundreds and even thousands of times higher than the standard. That grant is to be completed in July 2008.

The goal of this proposed project is to follow-up on that work. Specifically, it will allow Cedar Point, a town with limited financial resources, staffing and technical expertise, to begin taking the necessary steps to meet the bacteria limits established by the TMDL. We understand that neither the time nor the funds are available to address the needs of every small coastal town faced with similar water-quality issues and similar budgetary constraints. However, it appears the lessons we're learning in Cedar Point about stormwater runoff and bacteria in shellfish waters are fairly universal. It is our hope and intention that other coastal towns with similar pollution problems will be able to easily replicate the tools we develop with this project.

To this end, we have also partnered with the neighboring town of Cape Carteret. They too are faced with a growing population, increased development and declining water quality. The shellfish waters bordering the town – Deer Creek and western Bogue Sound – are designated Outstanding Resources Waters, yet are impaired due to bacterial contamination.

NCCF, our other partner, will help Cedar Point administer the grant and disseminate information about the project and tools developed. This non-profit organization received the current ongoing 319 grant to devise the TMDLs. It has also successfully completed several other 319 projects. Baker Engineering will be the main contractor to design the BMPs for this proposal. The company is working with NCCF in the current 319 project to devise the TMDLs and watershed management plans. And finally, Withers & Ravenel, an engineering firm with LID expertise and local ties, will aid the town in training and technical assistance on the LID spreadsheet and ordinance workshops.

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20. A detailed description of the project. Note: if project entails developing or implementing a Watershed Restoration Plan, see section 25. Expand space, if necessary

To implement the recommendations in the watershed plan developed by the previous 319 project and to meet the TMDL targets, Cedar Point wants to encourage the use of Low Impact Development (LID) techniques. This grant would fund a three-pronged approach to help the town achieve that goal.

Ordinance Development

Cedar Point, along with its partner Cape Carteret, understands that conventional stormwater approaches alone are not adequate to offset the effects of rapid urbanization and that additional stormwater management tools are needed to protect water quality. The towns, working with its partner NCCF and consultants, will develop an ordinance that will allow for LID technologies as an alternative to conventional development techniques. The ordinance will be a voluntary option for developers to satisfy federal, state and local stormwater requirements. NCCF will serve as project facilitator and assist the towns with development of the ordinance.

The towns will assemble a Technical Review Team to include representatives from the two towns, local engineers, developers and the N.C. Division of Water Quality that will develop the model LID ordinance. This team will also be instrumental in promoting adoption of the ordinance once the draft is complete.

Larry Coffman, a recognized national LID expert, and Withers & Ravenel, an engineering firm, will help the towns develop the ordinance, which will include a BMP design manual and a permit modeling tool. When complete, the modeling tool, called LID-EZ, will meet the design requirements of the ordinance and NCDWQ stormwater permitting. This modeling tool is a spreadsheet that will provide a standardized way to easily calculate the storage capacity of a combination of LID techniques compared to the storage capacity of a centralized stormwater pond or collection system. Withers & Ravenel is developing the spreadsheet for New Hanover and Brunswick counties, and NCDWQ has given it a favorable review. The tool will help state and local agencies determine whether LID applications meet applicable stormwater regulations and will assist project engineers by providing standardized calculations for LID techniques.

Withers & Ravenel will adapt the permit-modeling tool for Cedar Point and Cape Carteret and hold a daylong training workshop for officials from the two towns. The engineers will also be available for technical assistance for 12 months after the spreadsheet is developed. To make the tool more readily available to similar small coastal towns, Wither & Ravenel will give a presentation on the spreadsheet to a meeting of regional local government officials.

Retrofit BMPs

Cedar Point will redesign its town hall property to include five stormwater BMPs as educational sites. The grant will pay for the design, construction and signage of two BMPs at the current town hall. The grant will pay for the design of three additional BMPs that would be built during future expansion of the town hall site. The town hall area is identified in the current 319 project as a potential BMP site. These BMPs would be used to educate the public and other local governments on the use of stormwater BMPs in public buildings. To encourage replication, they

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will be kept simple. We anticipate that a rain garden and a cistern that will capture water from the town hall and maintenance building roofs will be chosen as the BMPs for the current town hall. Baker Engineering will design and oversee construction of the BMPs. NCCF will monitor groundwater at the rain garden to determine the effectiveness of the BMP.

Forty thousand dollars of this grant will be used to retrofit inexpensive LID techniques on homeowner lots or in subdivisions and commercial properties. These will consist of rain gardens and other types of small bioretention areas, cisterns, rain barrels and other types of affordable LID techniques. Our goal is to illustrate that property owners can make a difference in controlling stormwater without spending a great deal of money. We will choose the sites of these BMPs from the 24 priority areas being developed in the current TMDL project. We also expect, with these funds, to attract an additional \$20,000 from the N.C. Community Conservation Assistance Program. This new cost-share program of the N.C. Soil and Water Conservation District provides funding to design and install community LID BMPs. We hope to install a minimum of 10 of these BMPs.

Withers & Ravenel will also help Cedar Point develop an atlas of potential BMP sites that will be used to guide future retrofit projects. The company is currently developing a similar atlas for the Town of Manteo.

Another BMP, designed to control pet waste, will be developed at Western Park, a county-owned park that borders Cedar Point. Pet waste can be a major source of bacterial contamination of surface waters. To address this, the applicant and its partners will develop a program to encourage Western Park users to pick up after their pets when they bring them to the park. Signage and plastic bags will be sited throughout the park. The goal is to encourage pet owners to continue the practice wherever they walk their pets.

Education/Outreach

Cedar Point and its partners will engage and educate the public in a variety of ways:

- Three workshops and a field trip for public officials in the region will be held while we develop our LID stormwater ordinance. The purpose of the workshops will be to educate these local decision makers on using LID to control stormwater and the process needed to incorporate it in local ordinances. We hope they would replicate the process in their own communities.
- Signs and brochures at the BMP sites at the Cedar Point Town Hall and the neighborhoods.
- Press releases and media tours.
- A web page that will be routinely updated.
- Presentations to the Cedar Point and Cape Carteret town Councils and planning boards
- A public workshop on LID and field trip to neighborhood BMPs at the end of the project.

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21. Monitoring/Environmental Data Collection Describe in section below how project data will be used (i.e. demonstrate effectiveness of BMPs installed, calculate load reductions, data to be used for TMDL development, data to be used for State use support purposes, etc.). If monitoring is needed to document a demonstration project or water quality improvement, a Quality Assurance Project Plan (QAPP) will be required (reviewed and approved by DWQ). For guidance and additional information, visit: <http://www.epa.gov/owow/monitoring/volunteer/qappcovr.htm>

NCCF, using a Stanback intern under the direction of Dr. Bill Kirby-Smith at the Duke Marine Lab in Beaufort, will monitor groundwater at the rain garden at the Cedar Point Town Hall to determine its effectiveness. Dr. Kirby-Smith has spent his career researching the effect of stormwater on shellfish waters.

He would install a groundwater sampling well under the rain garden along with a surface flow sampler for inflow into the garden. For three months after the rain garden is completed, the intern would collect as many as 10 sets of grab samples following rains of >0.25 inches/24 hours. Samples will be collected in two bottles - one for sediment and nutrients and a second for fecal coliform bacteria. They would be analyzed at Dr. Kirby-Smith's laboratory.

Data collected from sample analysis will be managed and analyzed with MS Excel software. If additional statistical analysis outside MS Excel is needed, SAS JMP software will be utilized. Concentrations of target pollutants entering the rain garden and infiltrated into the ground water will be analyzed to determine the BMP's performance for pollutant removal

Dr. Kirby-Smith will help NCCF prepare a Quality Assurance Project Plan, which will be submitted to DWQ for approval before sampling begins.

22. Public Involvement

The projects will involve a variety of people in a variety of ways:

- The Project Review and Technical Review committees will include builders, engineers, and other citizens who will help direct the project and devise and promote the LID ordinance. These people can take the information and use it in their professional lives and peer groups.
- Representatives from local governments in the region will attend workshops on LID and on the process of developing the ordinance in the hopes that they will consider doing something similar in their towns.
- Public meetings, a web page, and media coverage will keep the public informed about the project and educate them about the effectiveness of small-scale LID projects.
- Brochures and signs will inform the public about the effectiveness of the BMPs.

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23. Project Measures of Success or “Measurable Results Anticipated from the Project”

- LID stormwater ordinances for two coastal towns that if enacted should result in measurable reductions of bacteria in 303(d) streams.
- A BMP manual and permit-modeling tool modified to meet the needs of Cedar Point and Cape Carteret and that will ensure that the LID ordinances will meet the standards set by state stormwater rules.
- An ordinance, manual and modeling tool that can be easily and inexpensively modified for use by other small coastal towns.
- Small-scale, community BMPs in priority watershed that will educate people on inexpensive methods to reduce stormwater.
- A “green” design of a public building and LID BMPs.
- A program at a public park to educate people about effects of pet waste on water quality.

24. List Project Outputs and Products (All 319 funded projects are *required to submit Quarterly Progress Reports and a detailed Final Project Report, which must be submitted at least *30 days before* the end of the contract for DWQ review and approval.*)

- LID stormwater ordinances for Cedar Point and Cape Carteret
- BMP manual to accompany ordinances
- Permit modeling tool to accompany ordinances
- One-day training workshop for Cedar Point and Cape Carteret officials on use of permit modeling tool
- Three LID workshops and a field trip for local government officials
- Two constructed BMPs at Cedar Point Town Hall
- Design of three other town hall BMPs that would be built when site expands
- At least 10 community LID BMPs in priority watershed.
- Pet waste program at Western Park
- Signs for all BMP sites
- BMP atlas for Cedar Point
- Two field trips to BMP sites
- Web page
- Press releases
- Media tours
- Quarterly progress reports
- Final project report

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25. Projects Developing or Implementing a Watershed Restoration Plan must include EPA's 9 Key Elements for Watershed Restoration Plans. Draft Plans must be submitted to DWQ for review and approval at least *60 days before* end of the project/contract period.

NOTE: Please provide information on the following ONLY if applying for Incremental funds to develop or implement a Watershed Restoration Plan: (use additional pages if necessary)

1	An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in the watershed
2	A description of the NPS management measures that will need to be implemented to achieve load reductions as well as to achieve other watershed goals identified in the watershed based plan
3	An estimate of the load reductions expected for the management measures
4	An estimate of the amount of technical and financial assistance needed associated costs and or sources and authorities that will be relied upon, to implement the plan
5	An information/education component that will be used to enhance public understanding of the project
6	A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious
7	A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented
8	A set of criteria that can be used to determine whether loading reductions are being achieved overtime and substantial progress is being made towards attaining water quality standards
9	A monitoring component to evaluate the effectiveness of the implementation efforts over time measured against the criteria established under item 8.

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1. The source of the impairment of ORW waters is fecal coliform bacteria that are contained in discharges of stormwater from the Cedar Point area.
2. To restore water quality and remove the impairment, a series of stormwater control measures will be required throughout the watersheds. The Town will prepare an Atlas of low impact development retrofit opportunities within the watershed, and will install these measures on a continuing basis until it achieves its goal of restoring the creeks' water quality.
3. The combination of stormwater control measures that the Town will have to install will need to treat runoff at its source and throughout the watershed and achieve almost a 100% load reduction in fecal coliform.
4. The total investment necessary to achieve its water quality goals will cost significant sums. To reduce this expense, the Town is developing partnerships with non-profits, universities and the private sector to obtain the technical assistance it needs to control stormwater pollution. It is also focusing its future efforts on identifying lower cost measures that it can install over time as part of its annual capital improvements budget. The Town is also considering revising its development ordinances to promote the use of low impact development measures to prevent any new stormwater problems from being created.
5. The construction of the LID BMP at the Town Hall will provide an outdoor classroom that can be used to broaden public awareness and education about stormwater management needs. The Town has entered into a formal partnership with NCCF to provide on-going education.
6. The Town is focused for the next two years on getting the BMP built, completing an Atlas of Low Impact Development opportunities, revising its development ordinances to include the promotion of Low Impact Development practices, holding education workshops, and developing a spreadsheet tool that can be used to design new Low Impact Development measures into existing and new development. It will use the Atlas to plan its future stormwater retrofits.
7. Completion of the park, completion of the Atlas, revision of ordinances, development of a spreadsheet, organizing workshops, and funds spend on stormwater retrofits.
8. The fecal coliform levels leaving the Town will be used to determine if retrofit measures are improving. The monitoring of pollution reductions achieved by the Town BMP will serve as an interim measure of success.
9. Project partners have designed a monitoring program to measure success.

26. References and Literature Cited

Draft 2008 303(d) list of impaired waters, DENR DWQ