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Hillsborough County
Florida

Office of the County Administrator
Patricia G. Bean

July 27, 2005

Mr. Tom Ash
Environmental Protection Commission of Hillsborough County
Environmental Resources Management Division / Pollution Recovery Fund
3629 Queen Palm Dr., Tampa, Florida 33619

RE: USF PRF Application for Industrial Facilities Stormwater Inspection Program

Dear Mr. Ash:

We have reviewed the attached application from USF, "Industrial Facilities Stormwater Inspection Program," and support the proposed project. The Stormwater Management Section of the Public Works Department expects to benefit from this effort, and hereby commits to collaborating with the USF Department of Environmental Science and Policy on the project in the tasks outlined in this application. We also commit to partial funding of the proposed project in the amount of $15,000 for Fiscal Year 2006 should the project be awarded the grant amount requested in the application.

We appreciate the Environmental Protection Commission's and the Citizen Environmental Advisory Committee's consideration of the proposed project, and should there be any questions related to our participation or support, please contact Mr. David Glicksberg at (813) 307-1782.

Sincerely,

Chin-Feng Ho

Chin-Feng Ho, Ph.D., P.E., Acting Manager
Stormwater Management Section
Hillsborough County Public Works Department

cc: Donald Duke, Ph.D., P.E., Assoc. Prof., Dept. of Environmental Science & Policy, USF
Jack Merriam, Environmental Manager, Stormwater Management, Public Works
David Glicksberg, P.G., Sr. Hydrologist, Stormwater Management, Public Works

Project Number _____

APPLICATION FOR POLLUTION RECOVERY FUND ASSISTANCE

DATE OF APPLICATION_____

A. BASIC ASSISTANCE

1. Applicant: The legal name of the applicant/organization, the organizational unit and the complete mailing address of the applicant.

Name: L. Donald Duke
Organization: University of South Florida
Address: 4202 E. Fowler Ave. NES 301
Tampa, Fl 33620-5200

2. Project Manager Information: Give name and title of the representative of the applicant who will be the Environmental Protection Commission's principle contact concerning this application

Name L. Donald Duke
Title Associate Professor
Address: 4202 E. Fowler Ave. NES 301
Tampa, Fl 33620-5200
Phone Number (813) 974-8087
Project Title Industrial Facilities Stormwater Inspection Program
Project Time Start: March 2006 End: April 2007
Total Cost of Project $ 52,000
Total EPC share requested $ 28,885

3. Assistance Type: New or Renewal (check one)

X New – Award of funds for initial request within the project period.

Renewal – Award of funds for a project beyond the current project period.

4. Project Location: The specific location(s) of the project. (Attach Site Map)
The project location is unincorporated Hillsborough County.

5. Is the Project for:

Restoration of a polluted area
Mitigation of the effects of pollution
X Pollution Control Activity to prevent or minimize pollution
Educational

6. Is the Project directed toward restoring an identified "polluted area" (a geographic area destroyed or altered by dredging or filling or contaminated by an emission or discharge), or toward terminating an identified pollution source? Identify and explain:

The project is directed toward terminating an identified pollution source. The targeted source is pollutants associated with stormwater runoff from industrial facilities. This runoff enters lakes, rivers, and other surrounding waterbodies having harmful effects on water resources and aquatic ecosystems throughout Hillsborough County.

7. Is the harm or potential harm to health, safety or welfare of the public or wildlife actual or potential? Does the project seek to alleviate actual or potential harm and what is the severity of the harm and the causal relationship between the "pollution" and the harm? Identify and explain:

The project will address actual harm to health and welfare of the public, as well as actual harm to wildlife that uses aquatic resources throughout Hillsborough County. The harm originates from the water quality impacts of pollutants in urban stormwater runoff. The project will address the portion of stormwater pollution that originates from one source, industrial runoff. The project will help alleviate this actual harm by improving outreach to, and inspections of, industrial facilities so that current discharges of pollutants are reduced. The same outreach and inspections will also alleviate potential harm, by improving information available to those same facilities in a way that their continuing and future industrial activities and pollutant reduction strategies will avoid discharge of pollutants in the future that could potentially increase the harm caused by pollutants conveyed in stormwater runoff.

The proportion of harmful pollutants in Hillsborough County runoff that originates with industrial facilities is not well documented, as indeed it is not for any urban or industrialized areas in the U.S. (USEPA 1995a; Duke et al. 1998). The causal relationship between pollutants in urban runoff, especially industrial storm runoff, and the harm it causes (degradation of water quality in urban waterbodies) has not been well quantified at the present time. Studies have documented that the pollutants are present, and represent a substantial proportion of pollutants contributing to degradation of water quality throughout the U.S. Industrial runoff has been recognized as contributing to pollutants in urban runoff since the Nationwide Urban Runoff Program research of the 1980s (Athayde et al. 1983), even though the exact quantification remains elusive. That study, and many that have been conducted since, have documented that urban runoff in general is a cause of actual and potential harm in urbanized areas throughout the U.S. (Duke et al. 2004), and the developed portions of Hillsborough County are typical of those studied areas. The USEPA's *National Water Quality Inventory* (USEPA 1995b) reports that runoff from urbanized areas is the leading source of impairments to lakes surveyed for that study.

8. How long has the pollution existed or how long before any harm will be evident?

Pollutants in runoff from industrial facilities have existed for as long as industry has been present in Hillsborough County. The pollution has been mitigated only to extent to which industrial facility operators practice good stewardship throughout the long history of industrial development. The 1990s was when regulations appeared at the Federal and State levels that place pollutant control requirements on industrial facility operators. Studies of industrial behavior have demonstrated that compliance with those requirements is far from complete (Duke, Coleman, and Masek 1999; Duke and Shaver 1999). It is widely recognized that, in the absence of diligent local programs such as the County inspection program proposed in this project, industrial facilities widely ignore these regulations and therefore continue to cause the harm of unregulated discharge of pollutants in industrial runoff. There is no reason to believe that Hillsborough County's industrial facilities are different from other facilities nationwide in this regard.
The harm from industrial runoff specifically is not evident at present solely because the harm from this specific source cannot be discerned, without extensive detailed field work and research, from the harm caused by runoff in general. The proposed project will address this one aspect of runoff pollution because of regulatory requirements to do so, along with requirements to address pollution contained in runoff from other land uses and activities in the greater urbanized region of Hillsborough County. Continuing urban growth throughout the unincorporated areas of the County could exacerbate the presence of pollutants in urban runoff in the future in the absence of efforts such as this to reduce pollutants and to avoid future pollutant discharges.

9. Identify and describe how the project proposes to alleviate the pollution (addressing technical, practical, and cost effectiveness issues):

The study would directly alleviate stormwater pollution to urban runoff by enhancing the effectiveness and efficiency of existing activities of the Hillsborough County Public Works Department, Stormwater Management Section (hereinafter called Stormwater Section). The project will improve an activity currently conducted by the Stormwater Section under compliance with a permit from the Florida Department of Environmental Protection (FDEP) for the County's Municipal Separate Storm Sewer System (MS4) under the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act (FDEP 2002). This permit requires the Stormwater Section to inspect industrial facilities expected to contribute substantial loads of pollutants in stormwater runoff, termed "high risk" facilities in the Permit's language.

Since receiving the initial permit in 1996, the Stormwater Section has met this requirement by adding stormwater inspection activities to inspections conducted on a routine basis for industrial facilities listed as small quantity generators (SQGs) of hazardous waste. It is not known with certainty whether a) all SQGs have stormwater compliance issues, therefore need stormwater inspections; or b) all facilities with a high likelihood of discharging pollutants in stormwater runoff appear on the SQG list. This

project will use methods previously developed by researchers at the University of South Florida (USF) to prepare a prioritized list of facilities in Hillsborough County that are likely to generate pollutants in substantial amounts, and allow Stormwater Section personnel to focus their efforts on those facilities rather than all facilities currently on the SQG list.

The proposed project is practical because it uses current methods and meets a current regulatory requirement of the Stormwater Section. The project is a practical enhancement of existing efforts, because inspections will continue to be conducted using personnel and methods now in place at the Stormwater Section. The project is extremely cost effective because it uses USF researchers, whose time and effort is available at a much lower cost per hour than a private consultant; and because it uses time and effort of current personnel of the Stormwater Section and other Hillsborough County agencies who are required to comply with these regulations. Most importantly, a specific project goal is to improve the cost effectiveness of current regulatory requirements, by targeting inspections toward facilities that will be identified as potential contributors to the problem of stormwater runoff pollution, rather than conducting inspections to a large number of facilities of which only a portion are contributors to this problem.

Details of the technical approach appear under the Scope of Work appended to this application as Attachment. Therefore the approach is presented here only in summary. In general, the approach entails the following steps: a) Develop a comprehensive list of facilities in unincorporated Hillsborough County that may generate pollutants in storm runoff associated with industrial activities; b) Narrow the list using a telephone questionnaire instrument, which has demonstrated capability to distinguish potential "high risk" facilities from facilities with little risk of stormwater pollutants; c) Verify telephone results with field inspections for a limited number of facilities. The project will employ methods previously developed by USF researchers that can identify facilities, not on the SQG list, that do have potential for discharging pollution in stormwater; and can also screen out facilities that are clearly not at high risk of discharging stormwater pollution. These methods were applied to industrial facilities in California (Duke et al. 1999; Duke et al. 2000), and have been revised to be more appropriate to Florida conditions through recent work in Pinellas County.

10. Is the polluted area one which has previously been subject to commission enforcement and, if so, when and what was the result?

Stormwater pollution has been subject to Hillsborough County enforcement under the County's MS4 permit since the permit was first issued in 1996. Some industrial facilities have been routinely inspected since that time. The current compliance method entails adding a stormwater component to existing inspections for hazardous waste small-quantity generator facilities (SQGs). That method has been considered adequate since the MS4 permit was first issued in 1996. However, clear guidance from FDEP (Noble, 2005) indicates that method will no longer be considered satisfactory.

Under the SQG program, approximately 16,000 facilities are inspected countywide, at a rate such that each facility is inspected approximately once every five years. All those facility inspections include an element that specifies review of the facilities' stormwater runoff, specifically whether the facility has implemented pollutant reduction measures (known as Best Management Practices, or BMPs). The result is to improve awareness among all 16,000 facility operators of potential for stormwater pollution and of the need to implement BMPs if appropriate, but on a time frame of once every five years.

The proposed project would prioritize these inspections so that a targeted list of facilities, on the order of up to approximately 400 facilities, would be identified as potential "high risk" facilities regarding stormwater pollution. This would allow for an increased frequency of inspections for these facilities that could more directly target stormwater runoff pollution issues. This would greatly enhance the capability of the Stormwater Section to convey its message of the importance of stormwater BMPs. The project will assure its resulting method will be considered effective and satisfactory to FDEP via communication with FDEP personnel; and will assure the method meets the needs and interests of the Stormwater Section by close cooperation with Stormwater Section personnel throughout the course of the project.

The amount of pollution reduced, avoided, or eliminated, either under existing enforcement or the proposed project, is not so readily quantified with the kinds of information available. That is because no regulation requires monitoring of pollution in storm runoff on a continuing basis: facilities complying with the FDEP Generic Permit are required to sample and test for pollutants in runoff on a schedule of once or twice per year, a routine that has been demonstrated to produce extremely imprecise information because of the natural variability of pollution in this form of discharge to the environment. Procedures to estimate total pollution from industrial facilities using this data have been shown to be inadequate. (USEPA1995a; Duke, Buffleben, and Bauersachs 1998.)

11. If no actual pollution exists and no prior commission enforcement action has occurred, does the project otherwise enhance pollution control activities within the County?

The project is designed to enhance pollution control activities within the County. The project will modify existing activities so that they better conform with State requirements, and so that they become both more effective at controlling pollutants and more efficient in the targeting of County resources toward those sources more likely to generate pollutants in substantial quantities.

12. Can this Project be divided into separate and independent parts, and if so,

a). what are they ?

The project cannot readily be divided into separate parts.

b.) how would the costs be allocated between them?

Not applicable – see above.

c.) would the applicant be willing to accept only partial funding?

The applicant would be willing to accept partial funding, if necessary. The scope could be adjusted so that, for example, a smaller number of industry types or a smaller geographic area could be targeted. However, the project has been designed to address a geographic extent and a group of industry types that are believed to be most effective in attaining the project's goals, and a smaller scope is expected to produce less return per dollar spent than the full funding requested for the project

13. Are other funding sources committed to the project? How much and for what?

Two other sources of funding have been committed to this project. The first source is the Hillsborough County Public Works Department, Stormwater Management Section, which has committed $15,000 as an expression of that agency's interest in and anticipated benefit from the proposed project. The proposed budget would use this funding to pay the salary and benefits of one researcher for nine months, which along with PRF funding will allow the project to pay salary, benefit, and tuition for a total of two researchers at the level of Graduate Research Assistant, one for nine months and one for 12 months. The total funding (PRF plus Stormwater Management Section) will allow the project to attain the scope described in this application. The second source of funding is the University of South Florida, which will make the in-kind contribution of $7,115 in the form of salary and benefits of the project's Principal Investigator, Prof. L. D. Duke. The University has committed that funding by approving this application. Prof. Duke is committing 10% of his time to supervision and technical guidance of this project for the entire project period. Both these matching funding contributions are documented in the attached Budget and Budget Justification.

14. What other funding sources may be available and how much?

There are two other sources that may potentially be available for this project, if it receives PRF funding. Project staff intends to use this project, if funded, as a matching source for an application to the Water Resources Research Institute for further funding. The Water Resources Research Institute is an academic grant awarded through the University of Florida, funded from Federal sources. That funding would address an additional scope of topics that are more academic in nature, such as research on quantifying pollutant loading from industrial facilities and on transport, fate, and effects of these pollutants in the environment. That funding source is highly competitive and may not be awarded, but the PRF funding would allow the Principal Investigator to apply

for those funds. The approximate duration of that funding would be one year, and the approximate amount would be $20,000.

A second potential source is the USF Environmental Science and Policy (ESP) Department, which each year chooses to pay tuition fees and salary to a certain number of researchers in conjunction with established supervised research. This project, if funded by the Pollution Recovery Fund, will qualify to compete for these funds. If selected, the Department funding would support one Graduate Assistant for nine months, at a funding level of approximately $11,000 for salary and $6,000 for tuition. This would allow the scope of the project to expand to better serve the needs of the Public Works Department, and would not be available in the absence of funding through PRF.

15. Why do you believe that this Project is of sufficient importance to justify the expenditure of Pollution Recovery Funds?

Of foremost importance, this project will address one of the major contributors of water pollution in urban areas, stormwater runoff. The project will help protect Hillsborough County's waterbodies, a crucial resource for human consumption and as environmental amenities which add to the quality of life in our county. This project will help reduce pollutants in stormwater runoff from industrial facilities in Hillsborough County, and help protect the County's water resources.

The project is also important for the Hillsborough County public because certain members of the public, those who operate and earn a living from facilities defined as "industrial" by federal stormwater regulations (USEPA 1992), are subject to State and County regulations, and evidence suggests that throughout the U.S. many facilities fail to comply (Duke, Coleman, and Masek, 1999). These facility operators are potentially subject to enforcement under the Clean Water Act by FDEP and/or USEPA. This project will serve a public need by helping facility operators learn about their duties to comply so they can avoid enforcement actions under the Clean Water Act.

16. Will the project enhance the value of private property, and if so, whose?

The project may indirectly enhance the value of private property in Hillsborough County by improving the overall water quality in the County's water bodies. Protecting the environment is an important amenity to the County's and Florida's citizens. By preventing water quality degradation it will in turn prevent depreciation of property value throughout the County.

B. ATTACHMENTS

Six attachments are appended to this document. The first five are as specified in the Application. Attachment 5 is a bibliography of documents referenced in the application text.

The following are attached to this document:

Attachment 1. A detailed map of the project site

Attachment 2. Biographical sketches of Principal Investigator and Key Personnel

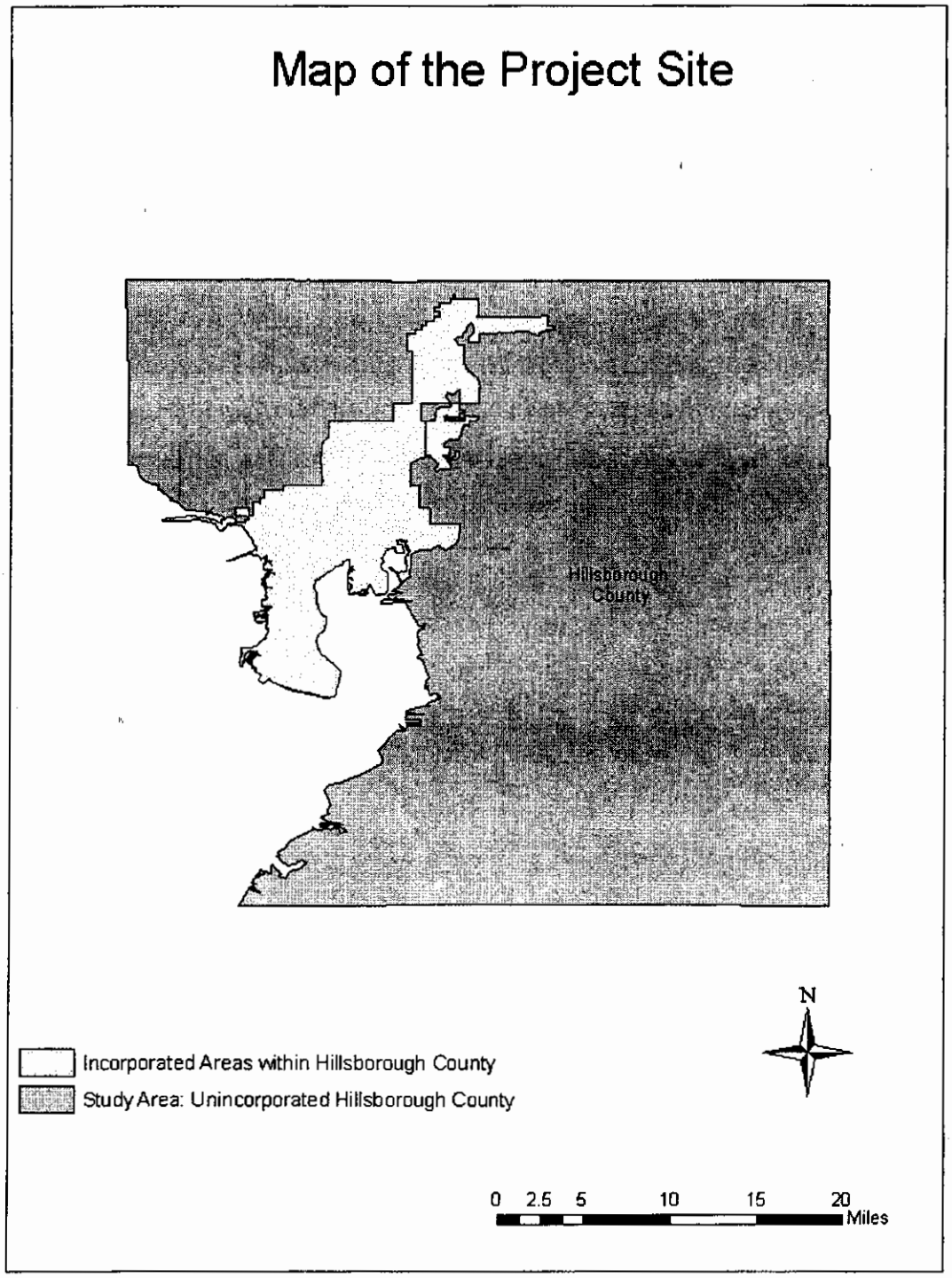
Attachment 3. Project Narrative

Attachment 4. Scope of Work

Attachment 5. Budget Information

Attachment 1. Map of the project site

This project will be conducted throughout the jurisdiction of the Hillsborough County Public Works Department Stormwater Management Section for purposes of compliance with the NPDES MS4 permit issued by FDEP. Those areas are the unincorporated portions of Hillsborough County plus the incorporated area of Plant City. Two incorporated cities within Hillsborough County are covered under separate MS4 permits, and are not included in the project area: the City of Tampa and the City of Temple Terrace A map of the county is attached, showing the areas within the project scope shaded grey and the areas not within this project scope as stippled white.



Study Area includes unincorporated Hillsborough County plus the city of Plant City. Areas not covered in the study area are the incorporated Cities of Tampa and Temple Terrace.

Attachment 2. Principal Investigator and Key Personnel

Biographical sketches are attached for:

Principal Investigator: L. Donald Duke, Ph.D., P.E.

Lead researcher: Kelly Gleaton, M.S. candidate, Graduate Assistant

L. DONALD DUKE, Associate Professor
Department of Environmental Science and Policy
University of South Florida
4202 E. Fowler Ave. NES 301 Tampa, FL 33620
813-974-8087 ldduke@cas.usf.edu

EDUCATION

Stanford University
Ph.D., Civil Engineering / Resources Planning, 1992
M.S., Civil Engineering / Infrastructure Planning and Management, 1984

University of Pennsylvania
B.S., Civil Engineering, 1980
B.A., English, 1980

PROFESSIONAL HISTORY

University of South Florida
Associate Professor, Department of Environmental Science and Policy, 2002 – present

California Regional Water Quality Control Board, Los Angeles
Water Resources Control Engineer, Total Maximum Daily Loads group, 2001 – 2002

University of California, Los Angeles
Assistant Professor, Environmental Science and Engineering Program, 1992 – 2001

RESEARCH INTERESTS

Watershed management and assessment, especially for urban watersheds; evaluation of pollutant sources; quantification of pollutants in urban storm runoff water discharges; transport, fate, and effects of urban pollutants on receiving waters and the natural environment; storm water and non-point source water pollutant source assessment and control programs; assessment of effectiveness of environmental regulations and policies.

SELECTED RECENT GRANTS AND CONTRACTS SUPERVISED

U.S. Environmental Protection Agency, 2000 – 2004. "Effectiveness Assessment of NPDES Regulations for Storm Water Discharges." $205,000.

Santa Monica Bay Restoration Foundation, 1999 – 2000. Industrial Storm Water Discharger Identification and Assessment for the City of Los Angeles." $65,000.

U.S. Environmental Protection Agency, 1999. "Physical Process and Decision Modeling in Support of TMDL Development." $31,000.

U.S. Environmental Protection Agency and California State Water Resources Control Board, 1995 – 1999. "Storm Water General Industrial Permit Non-Filers Identification and Communication." $200,000.

U.S. Environmental Protection Agency and California State Water Resources Control Board, 1995 – 1997. "Statewide Policy for Effective Prohibition of Non-Storm Water Discharges to Storm Water Conveyances." $50,000.

L. DONALD DUKE, Associate Professor, continued.

SELECTED RECENT PUBLICATIONS

Duke, L. Donald, 2004. "The Southwestern U.S. Urban Storm Water Quality Assessment." *Proceedings of the Environmental and Water Resources Institute 2004 Annual Meeting,* American Society of Civil Engineers, Salt Lake City UT: June 28, 2004.

Duke, L. Donald, 2001. "Industrial Storm Water Regulations and the Pollution Prevention Paradigm," *Proceedings of the 5th International Conference on Diffuse Pollution and Watershed Management*, International Water Association, Milwaukee WI: June 13, 2001.

Duke, L. Donald and Augustenborg, Cara, 2001. "Storm Water Discharges by Industrial Facilities in Four Urban Regions," *Proceedings of the World Water and Environmental Resources Congress*, American Society of Civil Engineers, Orlando: 2001.

Duke, L. Donald and Chang, Hyon, 2001. "Storm Water Pollution Prevention Compliance by Auto Dismantlers in the Los Angeles Region," *Proceedings of the World Water and Environmental Resources Congress*, American Society of Civil Engineers, Orlando: 2001.

Duke, L. Donald and Lewis, Chad, 2000. "Industrial Storm Water Discharges: Characterizing Los Angeles Facilities to Improve Compliance and Estimates of Pollutant Loads," *Proceedings, American Society of Civil Engineers Joint Conference on Water Resources Engineering and Water Resources Planning and Management*, Minneapolis: 2000.

Duke, L. Donald; Coleman, Kanan Patel; and Masek, Ben, 1999. "Widespread Failure to Comply with U.S. Storm Water Regulations for Industry, Part 1: Publicly-Available Data to Estimate Number of Potentially Regulated Facilities." *Environmental Engineering Science*, 16(4): 229-247.

Duke, L. Donald and Shaver, Kathleen, 1999. "Widespread Failure to Comply with U.S. Storm Water Regulations for Industry, Part 2: Facility-Level Evaluations to Estimate Number of Regulated Facilities." *Environmental Engineering Science*, 16(4): 249-263.

Duke, L. Donald and Bauersachs, Lisette, 1998. "Compliance with Storm Water Pollution Prevention Regulations by Metal Plating Industry Facilities." *Journal of the American Water Resources Association,* 34(1): 1-12.

Duke, L. Donald, and Beswick, Paul G., 1997. "Industry Compliance with Storm Water Pollution Prevention Regulations: The Case of Transportation Industry Facilities in California and the Los Angeles Region." *Journal of the American Water Resources Association,* 33(4): 825-838.

PROFESSIONAL AND TECHNICAL ADVISORY ACTIVITIES

Professional Engineer (Civil), California, no. C 052221

Fulbright Scholar, Environmental Research Institute, University of Iceland, Spring 2003

Technical Advisory Committee, Santa Monica Bay Restoration Project; Tampa Bay Estuary Program; Charter member, Florida Water Resources Monitoring Council.

Technical peer reviewer: *Water Environment Research; Water Resources Research; Environmental Science and Technology; Environmental Management; Environmental Engineering; Journal of the American Water Resources Association.*

Professional society memberships: *American Society of Civil Engineers; American Water Resources Association; Florida Stormwater Association; Society of Environmental Toxicology and Chemistry; Water Environment Federation.*

KELLY GLEATON, Graduate Assistant
Department of Environmental Science and Policy
University of South Florida
4202 E. Fowler Ave. NES 301 Tampa, FL 33620
813-974-8962 kgleaton@mail.usf.edu

EDUCATION

University of South Florida
M.S., Environmental Science and Policy, candidate

Selected Courses
Natural Resource Policy and Administration, Graduate Seminar in Environmental Policy, Environmental Law, History of Environmental Thought, Wildlife Ecology.

University of Florida
B.A., Environmental Science/Environmental Policy, 2004
Minor, Agriculture Law
Minor, Natural Resource and Environmental Ethics

Selected Courses
Environmental Science & Humanity, Agricultural & Natural Resources Ethics, Hydrology & Human Affairs, Natural Resources & Environmental Policy, Agriculture Water Management, Natural Resources & Environmental Economics.

EXPERIENCE

8/2004 to Present **University of South Florida** **Tampa, FL**
Graduate Assistant
Research and analysis for *Effectiveness Assessment of NPDES Regulations for Storm Water Discharges* U.S. EPA Clean Water Act §104(b)(3) grant.

5/2004 to Present **Golder Associates Inc.** **Tampa, FL**
Environmental Scientist
Project Planner for confidential power plant client: reviewed local government comprehensive plans and land development regulations for future land use, zoning, and regulatory requirements. Investigated upland and submerged land ownership, sovereign lands leasing, US Coast Guard permitting within navigable waters, and floodplain delineation.

Collected water use data for a variety of contaminated commercial sites; prepared sections of water use permit applications for various applicants.

Held lead responsibility for land use and socioeconomic portions of SCA power plant environmental assessments.

8/2002 to 1/2004 **MACTEC Environmental Engineering & Consulting** **Gainesville, FL**
Laboratory Technician
Conducted Natural Pollution Discharge Elimination System (NPDES) testing; Whole Effluent Toxicity (WET) testing; and monitored whole sediment toxicity and bioaccumulation tests.

AFFILIATIONS

American Water Resources Association (AWRA).
Air and Waste Management Association (AWMA): Education Chair, Tampa Chapter.

Attachment 3. Project Narrative

This project will identify facilities in the unincorporated areas of Hillsborough County that can be reasonably expected to generate pollution in substantial amounts in storm runoff associated with industrial activities. The project will use available information to prepare a lengthy, comprehensive list of potential target facilities, and then will use telephone and field techniques developed and tested by USF researchers to narrow down that list to a group on the order of up to approximately 400 facilities that should be targeted as potential sources of pollution of this kind. The project is a means of enhancing the effectiveness of activities now conducted by County agencies, required by State permits. The project will improve the current procedures so that they are more effective at targeting the most important facilities; are more responsive to current State guidelines for compliance with its permits; and are more effective at reducing this form of pollution. The project is in line with priorities of the Hillsborough County Public Works Department Stormwater Management Section, which has responsibility for compliance with the State permit, and project staff will coordinate efforts with Stormwater Management Section personnel throughout the project period to ensure project results meet the Section's needs and priorities.

a. Objectives of this Project

The overall objective of this project is to enhance the pollution control effectiveness and the cost-effectiveness of the Hillsborough County Public Works Department Stormwater Management Section program for industrial storm water runoff pollution prevention activities under the County's FDEP MS4 permit. The specific objectives are: 1) Develop and verify a targeted list that will allow inspectors to reach more facilities with high likelihood of discharging substantial amounts of pollution ("high-risk facilities") than at present; 2) Use the list to increase the frequency of inspection for those "high-risk facilities" by eliminating many facilities, currently inspected, that are not "high-risk"; 3) In so doing, bring the Stormwater Management Section's activities into line with FDEP's expectations for compliance with the MS4 permit; and 4) In so doing, reduce pollution county-wide in stormwater discharges associated with industrial activities, by bringing compliance and pollution-control information to facilities that need that information.

b. Results and Benefits Expected

The environmental benefit of this project will be a reduction in the pollution entering lakes and streams of Hillsborough County through stormwater runoff from industrial facilities. This benefit is not readily quantified in terms such as pounds of pollutants avoided, because storm water pollutants are highly variable and are not measured in ways that would allow any accurate quantitative estimate, as documented elsewhere in this application. Success of the project, therefore, will be measured as a programmatic achievement, in terms of the number of facilities generated for a new, verified list of "high-risk" facilities. The programmatic criteria for success are described in Section C. of this Attachment, below. The programmatic results, however, are only a means to measure the benefit, and are not in themselves the primary benefit: the number

of identified "high-risk" facilities is not an end in itself, but is a means to better direct County resources for effective protection of the environment, the end result that is intended of the various Federal and State regulations that are addressed by this project.

A second benefit of this project, both direct and immediate, is administrative. The project will develop and implement a method that Stormwater Section will be able to continue to employ that will make its compliance with its FDEP MS4 permit both more efficient in resources and more effective at protecting the environment. The project results will include a refined list of facilities in selected industrial groups that Stormwater Section can directly use for continuing inspections. Results will also include clear descriptions of the methods used by USF to develop the improved list, so that Stormwater Section can implement the same method for any other industrial or commercial sectors it chooses in order to continue refining and improving the efficiency and effectiveness of its inspection program long after the conclusion of this Project.

A third benefit of this project will accrue to the public in Hillsborough County. Industrial facilities in the County, which employ a substantial fraction of County residents, form the regulated community for Federal and State stormwater regulations. Many of these facilities do not hold the FDEP's NPDES permit for storm water discharges associated with industrial activities (USEPA 1995c) and it is expected that many of the un-permitted facilities would be subject to the Permit (Duke and Augustenborg, 2005). Limited resources at FDEP and at USEPA in the past have led to low enforcement of those permit requirements, but if either agency chooses to become more vigorous in its enforcement many facilities in Hillsborough County (and throughout the U.S.) could be liable to penalties for failure to comply with this portion of the U.S. Clean Water Act. The Project's telephone contacts and site visit activities include a component specifically designed for communication and outreach to those facilities about the nature of storm water regulations, which is intended to raise awareness in the regulated community about the existence of the Federal, State, and County regulations for storm water; about how to determine whether they may be subject to these regulations; and their duties under the regulations if they are required to comply. This outreach component is expected to improve compliance activities that specify reduction of storm water pollutants, and therefore to enhance the protection of water quality in Hillsborough County. The outreach component will also directly serve the regulated community by informing them of State and Federal regulations to which they may be subject, which can include penalties under the Clean Water Act if State and Federal agencies identify the facilities as failing to comply. This Project will increase the public's awareness of these compliance needs, and therefore improve the ability of industrial facilities to comply and avoid the potential liability of Clean Water Act penalties for non-compliance.

c. General Project Information

The results and successes of the project will be evaluated using a programmatic criterion. The measurable criterion for the project's success will be the number of industrial facilities that appear on the final list of facilities verified to be likely to discharge pollutants in substantial quantities in stormwater associated with industrial activities. That group of facilities will be a much more focused target for Stormwater Section inspections, and inspecting these facilities

more frequently will be much more likely to help prevent stormwater pollutants from being discharged into surface waters or the County's municipal separate storm sewers.

The project's goal will be to develop and verify a list on the order of approximately up to 400 facilities that are reasonably believed to be "high risk" facilities. Depending on available resources, the size of the regulated community, and priorities of the Stormwater Section, this list may be grouped within particular industrial categories chosen as the most important for Hillsborough County water pollution control. Also, these facilities will be grouped within geographic areas of the County chosen to be of greatest priority for water pollution control, such as identified impaired bodies with adopted Total Maximum Daily Loads, and particularly sensitive watersheds, streams, or lakes at immediate risk of water pollution problems. Continuing close cooperation with Stormwater Section personnel will ensure that the project selects industrial facilities that are of greatest concern to the County and/or offer the greatest opportunity for pollution reduction.

Attachment 4. Scope of Work

Proposed Work Plan

This one-year project will enhance activities of the Hillsborough County Public Works Department Stormwater Management Section toward reducing pollutants discharged in stormwater runoff from industrial facilities in the unincorporated portions of Hillsborough County.

Task 1: Select target industry categories and/or geographic areas.

The project's scope will be limited to a selected subset of industry in Hillsborough County, in order to make the best use of PRF funds by focusing on those industry categories with the greatest importance to stormwater pollution. This will produce a much more cost-effective inspection schedule that concentrates its resources on facilities that can benefit from compliance advice, pollution reduction guidance, and possibly enforcement attention.

USF personnel will work with Stormwater Section personnel to select industrial sectors and/or geographic areas of particular importance for Hillsborough County, toward which this research will focus the predominance of its efforts. Using knowledge of the industry sectors with substantial effects on stormwater throughout the U.S., along with knowledge of the Tampa Bay area gained through earlier research on Pinellas County industrial stormwater runoff, the following list of industry sectors is suggested as preliminary candidates for this list:

a. Automobile salvage operations and other facilities that collect or recycle scrap
b. Manufacturers of stone, clay, glass, and concrete products
c. Metal products manufacturing, including metal plating and coating
d. Chemical products manufacturing and/or bulk material handling facilities

The candidate sector list may be modified to add other industry sectors, or replace one or more of these candidate sectors. If Stormwater Section personnel identify industry sectors that should receive particular attention, they will also be added to the list. Other sectors may be added if the preliminary list to be developed in Task 2 shows any sectors with unexpectedly large numbers of facilities, so that the industry sectors addressed include those most likely to produce stormwater runoff pollution in Hillsborough County.

There is no preliminary indication that the project should focus attention on any particular geographic area within Hillsborough County. It is envisioned that the facilities on the final inspection list will be distributed throughout the unincorporated areas of the County, encompassing all areas under the jurisdiction of the Stormwater Section's MS4 permit. If Stormwater Section personnel identify high-priority geographic regions, the project will focus in those areas.

This task will be completed during the initial month of the project. A milestone deliverable will be completed, in the form of a memorandum from USF staff to Stormwater Section staff listing the industry sectors and/or geographic areas selected for the project.

Task 2: Identify candidate industrial facilities

The first task will be to develop an extensive list of facilities throughout Hillsborough County that could be considered candidates for inspection under the MS4 permit requirements. The USF research team will first develop a comprehensive list of industrial facilities in Hillsborough County that might be subject to federal stormwater regulations, and that might be among those with the potential to discharge substantial amounts of pollutants in storm runoff. That list will include all facilities currently on the SQG inspection list, as well as other facilities that could generate storm runoff but do not appear on that list. The comprehensive list uses a wide range of information from government sources as well as publicly-available databases. Resources that will be used in developing a comprehensive list will include:

a. Small quantity generators (existing inspection list);
b. NPDES and POTW wastewater discharger permit lists;
c. Toxic Release Inventory (TRI) facility databases;
d. Trade association information;
e. Local Chamber of Commerce information;
f. County business license lists;
g. Commercially-available lists of businesses in the target area;
h. Other regulatory agency information and other sources that may be identified and made available by Stormwater Section personnel and other County sources.

This task will be substantially completed in the first three months of the project. If additional information becomes available at that time, additional facilities within the targeted industry sectors or geographic areas may be added to the list. During Month 4, a milestone deliverable will be completed, in the form of a memorandum from USF staff to Stormwater Section staff including a table of the number of facilities in each targeted and non-targeted industry sector that appear on the candidate list.

Task 3: Preliminary screening of candidate industrial facilities

The USF research team will contact a large sample of these facilities by telephone, and will use the results to narrow down the list to those facilities with a reasonable likelihood of contributing to stormwater runoff.

This step is essential because a comprehensive list will include many facilities whose industrial category may place them in various government inventories even though the facilities may in fact not conduct industrial activities that are exposed to stormwater runoff. Therefore, these facilities have little likelihood of generating any pollutants of this form. For example, the telephone questionnaire can readily identify facilities that carry the industrial designation "printing and publishing," but which are retail photocopy operations without manufacturing or materials handling activities of the kind the stormwater regulations are designed to address. Some facilities of this type may appear on the SQG list on the grounds that they produce small

quantities of ink residue that require hazardous waste handling; but none of those residues are ever exposed to stormwater, so a stormwater inspection of such a facility is not a good use of resources.

The screening step of Task 3 will use the telephone questionnaire to purge the comprehensive list of entries describing facilities that do not conduct industrial activities of the kind that may generate pollution in stormwater runoff. The questionnaire process can also discern the difference between facilities that conduct few activities outdoors (minimal shipping/receiving, minimal rooftop air handling equipment, etc.) and facilities that are intensive outdoor operations such as concrete bulk material handling; metal product painting, washing, or storage; substantial chemical transfer and storage; or storage of scrapped automobiles or other scrap materials.

The telephone outreach uses a questionnaire developed and tested by USF researchers in previous efforts of this kind, including adaptation to Florida conditions through a recent research effort in Pinellas County. In addition to the lead researcher, it is anticipated that USF will employ two to four additional researchers to conduct the telephone screening. Telephone screeners are carefully trained so that all screeners are thoroughly familiar with the questionnaire, and so that results are consistent across all telephone personnel. Telephone personnel are also trained in issues of confidentiality of information and in conducting the phone survey in a professional manner that does not make unnecessary demands on the time and attention of the industry personnel who are contacted by telephone.

The telephone questionnaire screening phase is expected to be completed in 6 months after the task begins. At the completion of this task, USF will submit a memo report to the Stormwater Section tabulating the phone contacts completed; the industry sector and location of the facilities surveyed; and the overall results of the questionnaires, including the number of facilities removed from the list of candidates for inspection and the number of facilities confirmed as candidates for inspection.

Task 4: Field verification of preliminary screening results

A selected subset of contacted facilities will be visited by project personnel to verify the accuracy of the telephone screening and to support further judgments about the facilities' potential for discharging pollution in stormwater runoff. The field visit evaluations use procedures and materials previously used by USF researchers, and consist of observations from "outside the fenceline" of selected facilities. That is, project staff will observe the facilities strictly from locations that are open to the public (streets, sidewalks, and other areas that are not on the facility itself), and without contact with facility personnel.

This method is much less time- and resource-intensive than an agency inspection; is not disruptive of the time and attention of facility personnel; and avoids the need for project staff to accompany agency staff who hold the authority to inspect a private business for environmental compliance purposes. Results clearly are not as definitive as an on-site inspection regarding the kinds of activities conducted on-site or their potential for generating stormwater pollutants. However, previous application of this method has shown it is actually quite effective for decisions at the screening decision level, of the type intended for this project, where the goal of

the determination is to assess whether the facility is a good candidate for later detailed on-site inspections. If a facility is judged to be a good candidate by the results of Tasks 3 and 4, and the facility later receives a County inspection, the results of the later inspection can be used to make a reliable determination as to whether future inspections are valuable for continuing prevention of stormwater pollution. The goal of Tasks 3 and 4 is to avoid making County inspections to facilities that are clearly not candidates to be "high-risk" stormwater polluters, and field observations from outside the facility are effective at making that distinction.

Approximately 50 field visits will be conducted. Facilities selected as targets of the field visits will be drawn from three categories:

a) Facilities that could not be contacted using the contact information from the comprehensive database. Project staff will visit the stated site of the facility to determine whether it exists, or to identify any flaw in the information used as source data for the comprehensive database.

b) Facilities where the telephone questionnaire could not make a reasonably confident determination about the kinds of industrial activities conducted on-site, such that a site visit is necessary to make a screening determination as to whether the facility should remain on the list of candidates as "high risk" facilities.

c) Subsets of those determined "good candidates' or "screened out," to test the accuracy of the phone results (capability of the questionnaire to distinguish high risk from not high risk, and veracity of the respondent's information during the phone questionnaire)

The resulting list of facilities, including those visited first-hand by project staff, is considered to be a list of "candidate" facilities because the methods used by this project are not capable of determining with confidence the exact nature of activities conducted on-site at each industrial facility. The facilities should be determined to be either "high risk" or reliably not "high risk" only after first-hand inspection by County personnel, who have the necessary training to identify potential sources of stormwater pollution and who have the authority to enter these facilities and to make regulatory determinations such as the need for further inspections. The goal of the project is to make recommendations for targeting these inspections, not to make determinations about whether the inspections should be continued on the grounds that a given facility should or should not be denoted as "high risk" for purposes of continuing inspections in compliance with the County's MS4 permit.

Task 4 will be completed in 6 months after it begins. This task will be partially concurrent with Task 3, and will begin before Task 3 is completed, so that the total elapsed time of the project is within the target 12-month period. At the completion of this task, project staff will submit a brief tabular report to Stormwater Section personnel summarizing the number of facilities inspected, the industry category and general location of the facilities, and the results of the inspection.

Task 5: Reporting and record-keeping

Project staff will maintain a simple database to document results of the telephone questionnaires and field analyses. The databases will be provided to Stormwater Section personnel at the

conclusion of the project, for documentation of the results and for future use by the Stormwater Section if this type of inspection screening is applied to other County facilities.

Project staff will conduct sustained interaction with Hillsborough County Stormwater Section personnel to ensure the project supports Stormwater Section priorities, with ongoing adaptation of the project to meet the County's particular characteristics and needs. As part of this interaction, project staff will submit periodic brief reports to Stormwater Section staff in order to ensure continuing close coordination of the project activities with Stormwater Section priorities. A brief final report will also be provided, consisting primarily of tables and figures summarizing the achievements of each task. The reports submitted, and approximate submittal dates, will be as follows:

Task 1. Memo regarding selected industrial sectors. About 1 month after project initiation.

Task 2. Table of number of facilities, by industry sector, contained in initial version of the comprehensive database. About 3 months after project initiation. (This table may be updated if additional information is added to the database as the project progresses.)

Task 3. Table of results of telephone screening. About 9 months after project initiation.

Task 4. Table of results of field visits, and comparison to telephone screening. About 12 months after project initiation.

Final Report. Final versions of all tables from Tasks 1 through 4, plus electronic copies of the two databases (comprehensive list and results of phone and field evaluations) along with Geographic Information System (GIS) files describing the facility locations. About 13 months after project initiation.

USF personnel will retain a copy of the databases for use in preparing research publications, presentations at scholarly meetings, and other academic research purposes. The information about each facility observation will be held confidential, and any research publications by USF staff will refer only to aggregate statistics of the results in a way that no participating or observed industrial facility may be identified in connection with the reported observations.

Attachment 5. Budget Information

Budget information is attached in three forms:

a) Budget Categories form included in PRF packet

b) Budget form for use internally by USF, with additional detail

c) Budget Justification document for use internally by USF, with additional detail

a. BUDGET CATEGORIES

	PRF Funds	Federal	Applicant	State	Other
a. Personnel					
1. Faculty (P.I.)	$0	$0	$7,115	$0	$0
2. Graduate research assistants	15,000	0	0	0	15,000
3. Undergraduate research assistants	3,635	0	0	0	0
b. Administrative	0	0	0	0	0
c. Materials	2,300	0	0	0	0
d. Contractual	0	0	0	0	0
e. Construction	0	0	0	0	0
f. Other (tuition for graduate research assistants)	8,950	0	0	0	0
g. Total Direct Charges (Sum of a. to f.)	$29,885	$0	$7,115	$0	$15,000

Attachment 6. References

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3. Duke, L. Donald; Coleman, Kanan Patel; and Masek, Ben, 1999. "Widespread Failure to Comply with U.S. Storm Water Regulations for Industry, Part 1: Publicly-Available Data to Estimate Number of Potentially Regulated Facilities." *Environmental Engineering Science*, 16(4): 229-247.

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BUDGET

Storm Water Pollution Prevention for Hillsborough County Industrial Facilities

Application to Pollution Recovery Fund
Hillsborough County Environmental Protection Commission

Start Date: 1 March 2006
End Date: 30 April 2007

Schedule will be adjusted to be approximately 12 to 14 months in duration beginning at the time of the contract award, to coincide with the end of a USF semester.

Budget Categories	PRF	Cost-share: PWD	Cost-share: USF	Total all sources
I. Direct Costs				
a. Personnel				
1. Principal Investigator				
Dr. L. Donald Duke:				
10% time, academic year			6,000	6,000
2. Research Assistants				
Graduate Research				
Assistants: Two, 12 months	14,851	14,851		29,702
Undergraduate assistant(s):				
10 hr/wk, 30 wks	3,600			3,600
Total Personnel Costs	18,451	14,851	6,000	39,302
b. Fringe Benefits				0
Total benefits	185	149	1,115	1,448
c. Supplies				
Total supplies	2,300			2,300
d. Other Costs				0

Tuition: Two Graduate Assistants, 2 semesters	8,950			8,950
Total Other Costs	8,950	0	0	8,950
Total Direct Costs	29,885	15,000	7,115	51,999
Total Requested from PRF	$29,885			