2007 STATE INNOVATION GRANT PRE-PROPOSAL
ALABAMA PROJECT SUMMARY

Project Title	Aerial Surveillance — An Innovation in Multi-Media Resource Management and Environmental Quality Planning
Location	Alabama State-Wide Initiative
State Agency Applicant	AL Dept of Environmental Management (ADEM) 1400 Coliseum Blvd Montgomery, Alabama 36130-1463 Tel: 334/394-4316; Fax: 334/394-4326
State Project Manager	Michael Sherman, Field Operations Division Deputy Chief MHS@adem.state.al.us (phone/fax as above)
Total Project Cost	[Budgetary Information Withheld by U.S. EPA]
Project Period	Two years from the time of award receipt
Summary Statement	This project is to develop an innovative multi-media detection and identification system in the form of an *ADEM Aerial Reconnaissance Program* to improve compliance with Federal and State regulatory statutes in order to reduce air, water, or solid/hazardous waste pollution and ensure environmental quality in Alabama.
Statutory Authority & Flexibility	This project is not being executed in cooperation with, or funded by, another Federal program. Federal regulatory flexibility to implement the project is not required at this time.
Statement of Support	This project has the support of ADEM Senior Administration. A letter of commitment from the ADEM Director will be submitted if this proposal is a finalist for Federal Assistance.

PRE-PROPOSAL NARRATIVE

PROJECT DESCRIPTION

Problem/Issue Statement

Alabama faces a tremendous challenge to protect and/or restore the State's 77,000+ miles of perennial and intermittent streams and rivers, 463,587 acres of publicly-owned lakes and reservoirs, 610 square miles of estuaries and 50 miles of coastal shoreline (ADEM Monitoring Strategy 2005). Addressing the traditionally difficult-to-locate pollutant sources through the inspection and permitting process is a vital component of the overall surface water resource management effort. Illegal dumps and other similar activities located in the primarily rural areas of Alabama are of critical importance to the Department's recently created *Environmental Justice Office*; and emergency responses to such multi-media environmental problems as fish kills and hazardous material spills or natural disasters can be difficult to evaluate/monitor in remote areas.

Longstanding or historical environmental monitoring and permitting systems do not have the ability or sensitivity to locate and effectively control all pollution sources, some of which can cause acute localized environmental impacts. Traditional inspections have already harvested the low hanging fruit; however, some persistent and stubborn pollutant discharge situations remain unaddressed. These can cause significant pollutant loading, localized water quality degradations, including, where sediment is concerned, severe habitat modification or loss, and species impacts. The only way to address these areas is to develop an innovative detection and identification system that when combined with traditional systems will better identify in a timely manner and address these uncontrolled significant pollutant sources (*EPA Innovation Strategy* Element 2). This class of discharges when located in rural, difficult access areas represents a pollutant sector in itself, no different than a general permit designed to identify, permit, provide compliance assistance, and ensure enforcement for a class of operators that have traditionally been permitted (such as a junk yard). It may be that these pollutant sources are intermittent or the operators don't realize that they need permit coverage or are causing a significant environmental problem. Various available internet-based satellite imagery, such as the public accessible version of "Google Earth", or aerial photography are insufficient as a locator tool due to the limited update frequency particularly for temporary construction activities or dirt pits, and obviously, dumps and spills. Attempting to locate these sources from the ground by driving rural roads searching for environmental problems is extremely resource intensive in terms of staff days and vehicles/maintenance; and in many cases impossible due to land-based access limitations.

Project Goals

To address these issues, ADEM leased/purchased a single engine aircraft and hired a pilot in early 2006 to initiate the development of an A*erial Surveillance Program* within its Field Operations Division.

This two-year project proposes to accomplish the following goals in the development of the Department's *Aerial Surveillance Program*:

- Purchase and install aircraft-mounted camera/laser GPS units and associated software.
- Provide enhanced environmental location information resulting in greater inspection efficiency and improved permit compliance through assistance or the enforcement process.
- Provide a tool for better prioritization of resources to focus on pollution problems.
- Provide consultation and detailed documentation to other states interested in adopting this approach to environmental improvement.
- Develop a final report to publicize the outcomes and methods developed/used.

Innovative Changes in Processes

Focus on environmental performance and results

The initiation of the ADEM regulatory compliance process has long relied on staff inspections of permitted facilities or the citizen complaint investigation process. Limited staff levels and funding resources simply do not allow for a plodding/systematic comprehensive ground surveillance program. As discussed above, even if there were adequate resources, many remote sites could still not be detected. This project initiates a change in the management and allocation of staff and resources to demonstrate the innovative use of aerial surveillance as a pro-active component of the regulatory compliance process. Information is collected from aerial "sightings" with no corresponding permitted map location or with apparent potential regulatory violations. Ultimately, the improved compliance with federal and state regulations will lead to improvements in environmental quality.

Integrate environmental management more fully across facilities, problems, and media

Target photographic and location assignment equipment (Laptop based GIS software/ manual operated GPS and hand held digital cameras) currently used by the surveillance program crew provides less than precise/accurate location information that is critical for efficient resource use. This has created a hurdle for the inspectors on the ground and has resulted in a less than acceptable follow-up effectiveness especially in rural/remote areas of Alabama. A portion of the proposed project funds are to purchase equipment designed to alleviate this challenge.

The incorporation of appropriate equipment provides accurate location measurements to on-the-ground multi-media inspection staff and accurate mapping of the range and extent of environmental emergencies or disasters. In addition to the improved accuracy when incorporating the appropriate equipment, it is estimated that two-to-three fewer flight crew members would be necessary to operate the new equipment (estimated 25% savings) providing additional ground resources to conduct "sighting" inspections and/or sampling. Using the current technology, individual sites may take a day or more to locate and inspect. The improved accuracy and photographic documentation (including video) for sightings is anticipated to greatly increase efficiency leading to a significant resource savings.

Transferring Innovation

Many state environmental agencies own or have access to aircraft and could benefit from this project's demonstration of the aerial surveillance process under development by ADEM. Staff working on this project will be available to explain this approach to interested parties including discussions of successes and methods developed to overcome challenges. Staff would also be available to the maximum extent possible for more direct interaction or to attend/present findings at meetings with other states or tribes should the need arise.

Specific procedures will be developed to 1) conduct pre-flight preparation; 2) accurately locate and document "sightings" during the flights; 3) compare these locations with known permitted sites; 4) effectively track these locations; and 5) conduct efficient on-the-ground follow-up on all aerial sightings. These systems, equipment specifications, and procedures proposed for development and testing during this project will be documented in SOP(s) and made available to interested parties.

ADEM has a strong track record for completion of the various projects for which EPA has provided funding. All staff participating in this program will be trained in applicable procedures to ensure consistency throughout the project. The primary staff associated with this proposed project have been closely involved with the planning and preliminary feasibility testing conducted during 2006.

PROJECT SCHEDULE AND TIMELINE

All milestones in the table below are based upon a starting date in October 2007. If the grant award is made earlier or later, the milestones will be adjusted accordingly.

Key Project Milestones

	Fiscal Year 1				*Fiscal Year 2*			
	1st QTR	2nd QTR	3rd QTR	4th QTR	1st QTR	2nd QTR	3rd QTR	4th QTR
1.0 Purchase/Install Equipment								
2.0 Conduct Project Surveillance								
3.0 Conduct Follow-up								
4.0 Finalize Documentation								
5.0 Reporting								

Project Tasks and Deliverables

Specifically, the proposed project would consist of the following tasks:

1.0 Purchase/Install Equipment

1.1 Purchase Camera/GPS Unit and software
1.2 Conduct Installation of Camera/GPS Unit & Software

2.0 Conduct Aerial Surveillance

2.1 Complete Aerial Surveillance SOP draft
2.1 Conduct Aerial Surveillance of a minimum of five Central Alabama Counties
2.2 Track each location identified using GIS

3.0 Conduct Follow-up

3.1 Conduct indicated follow-up, typically inspections.
3.2 Track follow-up actions and outcomes

4.0 Finalize Documentation

4.1 Finalize aerial surveillance procedures and Standard Operating Procedures Document (SOP)

5.0 Reporting

5.1 Measure Short-term Outputs & Improvement Outcomes (Based on Subtask 3.2)
- Number of counties flown
- Number of aerial sightings (sites/facilities)
- Number of facilities inspected by media type
- Number of new permits issued by media type
- Number of enforcement actions by media type
- Penalty totals assessed by media type

5.2 Produce GIS Data
- Maps of aerial sightings and flight lines
- Analyze data for patterns or tends using other available GIS data

5.3 Complete Progress Reports
5.4 Complete Final Report

THRESHOLD CRITERIA

The ADEM *Aerial Surveillance Program* is a multi-media state-wide approach to compliance and enforcement. The activities, authorized under the *Clean Air Act* and *Clean Water Act*, consist of the investigation and demonstration of aerial surveillance data gathering activities as a pro-active component of the regulatory compliance process. The project activities directly address the prevention, reduction, or elimination of air, water, or solid/hazardous waste pollution (EPA Strategic Goal 1 – Clean Air and Global Climate Change; Goal 2 –Clean and Safe Water; and Goal 3 – Land Preservation and Restoration). Initial estimates indicate that a significant number of aerial surveillance locations/facilities could be inspected, permitted, provided compliance assistance, or entered into the enforcement process as a direct result of the developing ADEM *Aerial Surveillance Program* (including land disposal sites and dischargers to air and surface water). The development, standardization, and documentation of these methods provide a template for other state environmental agencies or tribes. In addition, this project addresses efforts to apply an alternative approach to standard on-the-ground methods of enhancing the management and protection of the environment through the more cost-effective and efficient methods of aerial surveillance (EPA Strategic Goal 5, sub-objective 5.2.4). This project will demonstrate the use of this innovative method to assure and enhance compliance with Federal and State regulatory statutes.

A key issue highlighted in the ADEM *Strategic Plan* and the Alabama Governors FY07 *SMART* (Specific, Measurable, Accountable, Responsive, Transparent) budgeting efforts involves the evaluation of the Department's multi-media compliance program and development of measures to evaluate compliance rates. This key issue is also planned for incorporation into a Performance Partnership Agreement with EPA as an end result of a federal workgroup for which ADEM has been selected to participate. This workgroup for exploration of Performance Partnership Grants (PPGs) and Performance Partnership Agreements (PPAs) provides the Department with a unique opportunity to develop these tools in a way that is beneficial to both the Department and EPA. This project provides an opportunity for the development of methods to improve the efficiency and effectiveness of the Department's compliance efforts**.**

ENVIRONMENTAL OUTPUTS & OUTCOMES

The following are the planned outputs as a result of this project:

- Finalized Aerial Surveillance SOP (Based upon Subtask 4.1): Completed after review and signature by program manager and Field Operations Division Chief.
- Measuring Short-term Outputs & Improvements (Based upon Subtask 3.2): Completed after compilation, review, and presentation to Field Operations Division Chief.
- GIS Maps of aerial sightings and flight lines (Based upon Subtask 5.2): Completed upon submission to Field Operations Division Chief and EPA
- Progress Reports (Based upon Subtask 5.3): Completed upon submission to Field Operations Division Chief and EPA.
- Final Report (Based upon Subtask 5.4): Completed upon submission to Field Operations Division Chief and EPA.

The following are the proposed outcomes as a result of full implementation of the ADEM Aerial Surveillance Program:

- Development/refinement of aerial surveillance procedures (short-term): Evaluated by review and revision of methods to optimize the efficiency and effectiveness of the program. The number of sightings documented as compared to the number of locations.
- Increased community awareness of permitting requirements (intermediate-term): Evaluated by trends in the number of sites within specific categories such as Mining, construction, etc. found to be un-permitted.
- Decreased pollutant loadings and increasing environmental quality as indicated by the ADEM ambient environmental monitoring program (long-term): Evaluated by trends in the number of monitoring locations that are determined to be in non-attainment.

PUBLIC INVOLVEMENT, COLLABORATIONS, OR PARTNERSHIPS

As sightings are made within the jurisdiction of the delegated *Jefferson County* and *City of Huntsville* Air Monitoring Programs, the locations and associated information will be provided to the program contacts for their inspection and follow-up. Surveillance data

related to sightings which cross state boundaries will be provided to the respective state environmental agency for their information and follow-up. Any follow-up data will be included in the evaluation of the overall program effectiveness.

BUDGET SUMMARY INFORMATION

State Agency: Alabama Department of Environmental Management
Project Title: Aerial Surveillance — An Innovation in Multi-Media Resource Management and Environmental Quality Planning

[Budgetary Information Withheld by U.S. EPA]

* Source of State Funds: These funds will be allocated from non-federal Departmental funds

ENVIRONMENTAL RESULTS PAST PERFORMANCE

Since 1982 ADEM has served as Alabama's lead environmental regulatory agency. ADEM has authorization from EPA to implement the major environmental regulatory programs related to air, water and hazardous waste. The Department has completed numerous projects funded in whole or in part by EPA. Recent federal assistance agreements include those listed below. Each of these has required estimates of expected results as well as measurement and reporting of "actual" results. The collected data and/or summaries are reported in the midterm and final grant reports and are transmitted from ADEM to the appropriate EPA program/project coordinator(s).

Grant Id #	**Description**
I97497106	Ground Water Program
G00435106	Underground Injection Control (UIC) Program
C600474706	Water Quality Planning Program
F00429106	Public Water Supply Program
CD98497300	Baldwin Co Wetlands Project

PROGRAMMATIC CAPABILITY.

As an example, since 1989 ADEM has actively promoted pollution prevention, and has successfully completed more than 10 projects under the *Pollution Prevention Incentives for States* grant program. Each of these required estimates of expected results (in terms of waste reduced) as well as measurement and reporting of "actual" results. Prior to the award of the 06 grant, ADEM entered into a memorandum of agreement to participate in the National P2 Results Data System which required the Department to use core pollution prevention metrics for data collection and results reporting. The collected data are reported in the midterm and final grant reports and are transmitted from ADEM to the P2Rx Center in Raleigh, NC for incorporation into the national P2 Results Database. Recent federal assistance agreements for this program include:

Assistance ID #	Description
NP-97420204	Pollution Prevention Grant Program
NP-97420205	Pollution Prevention Grant Program
NP-97420206	Pollution Prevention Grant Program