U.S. ARMY RESERVE
81ST READINESS DIVISION
Fort Jackson, South Carolina

INTRODUCTION

The 81st Readiness Division (RD) is a large, complex, geographically distributed, installation-like military organization that manages over 250 Army Reserve facilities and approximately 1,500 acres of land in Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and the Commonwealth of Puerto Rico. The 81st RD is a tenant on active Army installations, Navy installations, Air Force bases, and National Guard camps and training areas, sharing facilities with the National Guard in various states (sometimes as a landlord and sometimes as a tenant). While many 81st RD facilities are on military installations, some are in the community on small parcels of federal land.
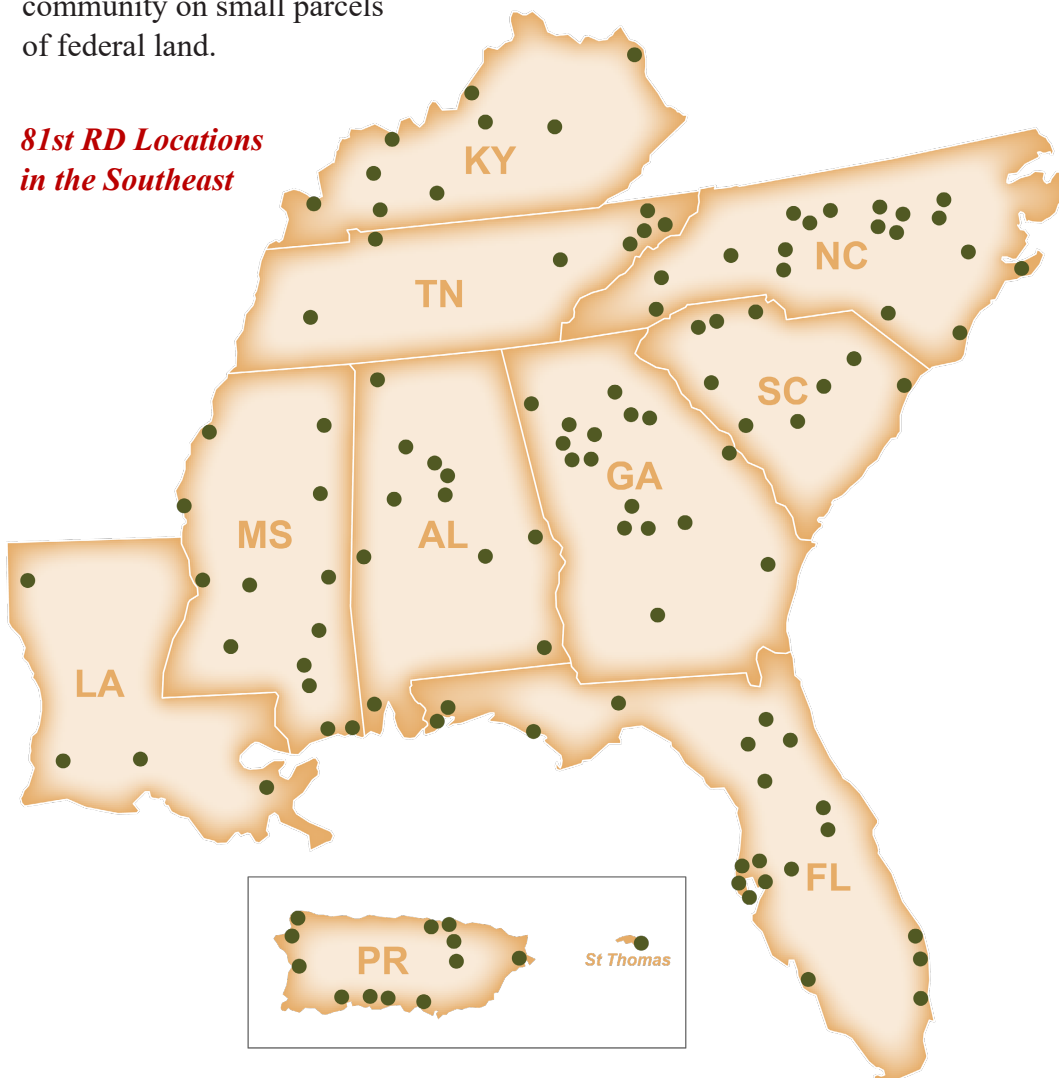
81st RD Mission

The 81st RD is a U.S. Army Reserve Command headquartered in Fort Jackson, South Carolina. The 81st RD provides facility support for Army Reserve Soldiers, civilians, and families in the southeast U.S. and Puerto Rico and supports troop deployment worldwide. The 81st RD had an environmental budget of $4.6 million in fiscal year 2023.

81st RD Locations in the Southeast

Under the Federal Facilities Compliance Act, the Army Reserve complies with state and local environmental regulations where these regulations enforce federal laws. As such, the 81st RD implements their state-specific Hazardous Waste/Hazardous Materials Management Plans and their site-specific Spill Response Plans and Best Management Practices Plans.

There are approximately 50,000 Army Reserve occupants of 81st RD facilities, only approximately 2,000 of which work for the 81st RD. The remainder work for other Army Reserve commands and are only indirectly answerable to the RD.

There are three 81st RD civilians, eight U.S. Army Corps of Engineers, and eight SERES contract employees supporting 81st RD environmental programs in the region. This staff is assigned within the Directorate of Public Works, which is part of the Installation Management Directorate of the Division. The environmental staff interacts with the following entities:

- Directorate of Public Works, Installation Management Directorate, other directorates in the RD, and other Army Reserve elements (lateral organizations and higher headquarters)

- Tenants (Army Reserve, Navy, U.S. Marine Corps Reserves)

- Army elements outside the Army Reserve (installations, the Army Environmental Command, the Army Staff, the U.S. Army Corps of Engineers, etc.)

- Department of Defense (DoD) organizations outside the Department of the Army (Navy, Air Force, Defense Logistics Agency-Disposition Services, various National Guards)

- Regulators (U.S. Environmental Protection Agency Regions II, IV, and VI; U.S. Fish and Wildlife Service Regions IV and VI; ten state-level environmental regulators, ten state-level natural resource regulators, ten state-level State Historic Preservation Officers, and local regulators as each state may deem appropriate)

- Other stakeholders (landlords, cities, Native American Tribal Authorities, neighbors)

The geographic dispersion, number of facilities, number of tenants, and dispersal of control complicate environmental compliance and conservation efforts. This also hinders the 81st RD's efforts to understand the depth of compliance issues across their programs. While they might hear of an issue here or there, without some predictive analysis, it has been impossible – with the number of programs and the volume of people involved in each – to recognize a systemic or acute concern.

BACKGROUND

There is a long history of militias in the U.S., with these early militias eventually evolving into the National Guard. In 1908, Congress established the Reserve Medical Officer's Corps and over the next several years, the concept of an organized federal force designed to supplement the regular Army was implemented. Over the next 114 years, the changes from Reserve Medical Officer's Corps to Reserve Officers Training Corps to Officers' Reserve Corps to Army Reserve Commands to Regional Readiness Commands to Regional Support Commands resulted in reorganizations and headquarters relocations. Because of these changes, experienced personnel did not always move with the headquarters. In each transition, some information critical to environmental compliance did not survive, resulting in fragmented knowledge and documentation for facilities for which the 81st RD is responsible.

Within the 81st RD, the Environmental Division manages a full-spectrum environmental program ranging from hazardous and regulated waste management and turn-in, Clean Air Act (CAA) compliance/permitting, stormwater management/Clean Water Act (CWA) permitting, spill response and cleanup, Toxic Substances Control Act compliance (asbestos and polychlorinated biphenyls), invasive species identification, natural resource management (endangered species, wetlands, and Local Training Area use), cultural resource management, integrated pest management, National Environmental Policy Act planning, property acquisition and disposal, restoration and cleanup, consultation with state and federal regulators and Native American Tribal Authorities, Environmental Performance Assessment System (EPAS) audits (conducted both internally and externally), environmental quality reporting, and budget request/justification/execution. The program is executed in accordance with Army Regulation 200-1. The mission of the Environmental Division is to continuously improve the environmental compliance status of the Army Reserve units in the 81st RD region and to maximize regulatory compliance within budgetary constraints.

✓ **Meets Program Management Criteria**

The 81st RD staff operates in a complex, adaptive systems environment that is geographically distributed, politically fragmented, and multilevel, with multiple actors at each level. There is a bilateral interaction among all actors, and the 81st RD does not have full control over most sites. Each site is a unique mix of operational capacity, storage capacity, equipment, 81st RD responsibility, unit responsibility, and regulations. One law may regulate several aspects of a site. For instance, the CWA regulations apply to both stormwater runoff and industrial wastewater.

The amount of detail required to understand the impact of every regulation on each facility across the 81st RD's footprint is overwhelming. There are 110 maintenance facilities that are not located at an installation and, consequently, 110 sites with less-than-ideal environmental compliance oversight because of staffing and funding constraints. Every site that belongs to the 81st RD is subject to the National Historic Preservation Act, at least to the level of requiring survey and analysis as the site ages. Every site has CWA and CAA requirements. There are thousands of separate data points that can be sorted by program, facility, or state. Then there is the issue of complying with those regulations across the region and the various operational and permitting requirements as interpreted by separate state, commonwealth, and local regulators. In addition, there is an 81st RD program manager with each program. There could be multiple 81st RD staff who are not co-located and who oversee small portions of the compliance. There are also compliance specialists who are responsible for an 81st RD site within a designated state where the specialist may not live. There can be pieces of information that are known by some staff and not others. It is difficult to organize, prioritize, and oversee a scenario this complex.
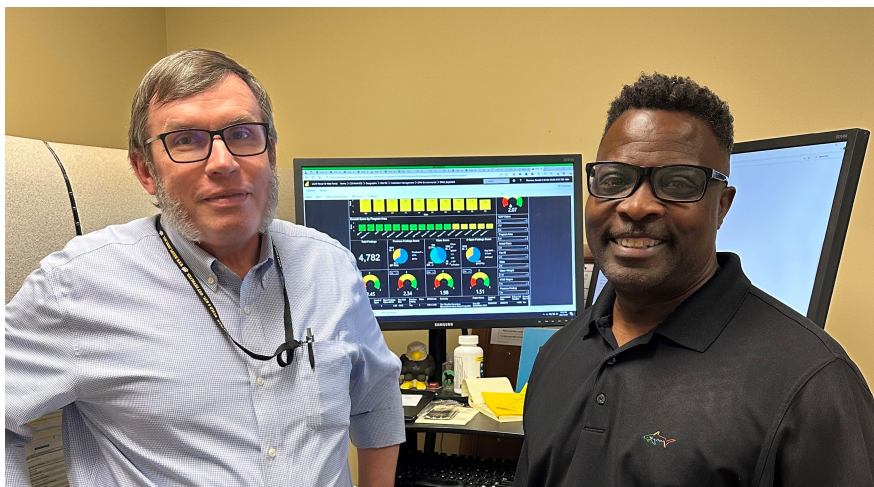
81st RD staff monitoring environmental compliance metrics through data analytics dashboards

SUMMARY OF ACCOMPLISHMENTS

The 81st RD has developed a predictive data analytics system consisting of data scorecards and dashboards to address the following needs and milestones:

- Provide a central location for staff that are not co-located to document information about the facilities under 81st RD operation, helping mitigate both compliance risk and historical organizational knowledge loss.

- Standardize, quantify, analyze, and display the raw data, allowing for easier analysis and actioning.

- Deliver an emotion-free and comprehensive examination of the data to highlight issues so that critical problems are identified and brought to the attention of leadership early, before they become urgent and potentially costly from both economic and environmental costs.

✓ **Meets Program Management and**
✓ **Technical Merit Criteria**

When the 81st RD started collecting the data and deciding which pieces of data were the most important for evaluating environmental compliance risk, data gaps were identified. In addition, the various federal, state, city, and county regulations and requirements were also not fully understood. Data gaps were filled, and regulatory requirements were identified and documented. As a result, the data for all 81st RD sites are organized in a central location as dashboards for several environmental media areas: Air Quality, Cultural Resources, Drinking Water, EPAS, Natural Resources, Tanks, Stormwater, and Wastewater.

Mitigating Compliance Risk

To address compliance risk, the relevant compliance risk program(s) was identified, and the status of that program's risk is shown graphically. Without having to wade through communications and paperwork, 81st RD staff can identify when actions are needed to maintain environmental compliance.

Figure 1. Tanks Scorecard

For example, it was known to the 81st RD staff via internal conversations that some of the Spill, Prevention, Control, and Countermeasure Plans for their facilities had expired. What the 81st RD did not know was the depth and breadth of the expired plans. In the recently developed Tanks Scorecard (Figure 1), expired plans requiring review and updates are color-coded red and yellow, respectively, to alert the Program Manager of the plan expiration status. Over 75% of the plans were expired.

Expired plans can be a compliance risk to the 81st RD. The 81st RD has since been able to use this emotion-free data to obtain funding from leadership to review and update these plans. The success is that the predictive analysis informed the 81st RD of the issue so that leadership support via funding could be obtained. The 81st RD has started the process to contract with an engineering firm to review and update spill plans, 100% of which are scheduled to be reviewed and updated by Fiscal Year 2024 (FY24).
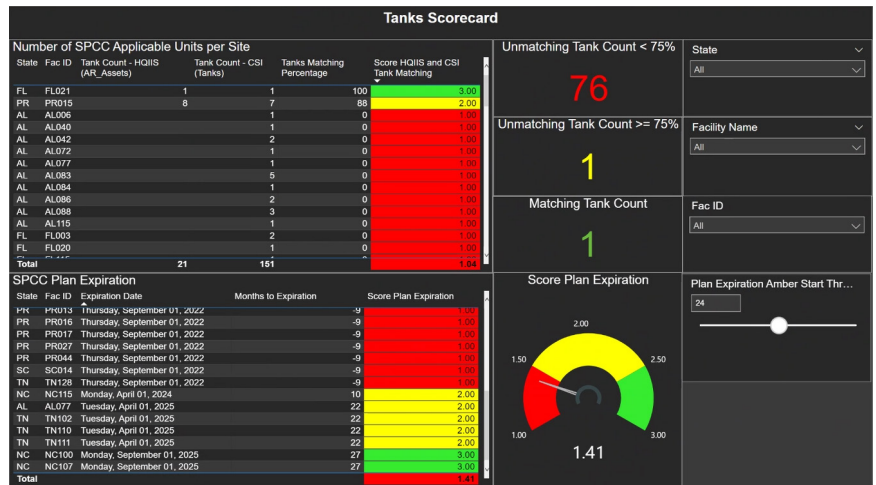
Compliance with environmental regulations and Army policies can be seen through the results of EPAS audits (both internal and external). The 81st RD has an EPAS Program Scorecard Dashboard (Figure 2) that provides data about the number of compliance findings, number of repeat findings, and open findings for each of 14 media areas for each state and each 81st RD facility within the state.

EPAS findings are generally identified by the 81st RD internal staff, state specialists, or third-party contractors. Over 40 individuals could identify and enter a finding that might not ever be noticed by another auditor or leadership. The importance of this is

Figure 2. EPAS Program Scorecard Dashboard

understanding RD-wide (vs. facility or state-wide) issues. Without this dashboard, the 81st RD would not know about RD-wide issues and has, until now, lacked the ability to design and implement their compliance program across their entire purview.
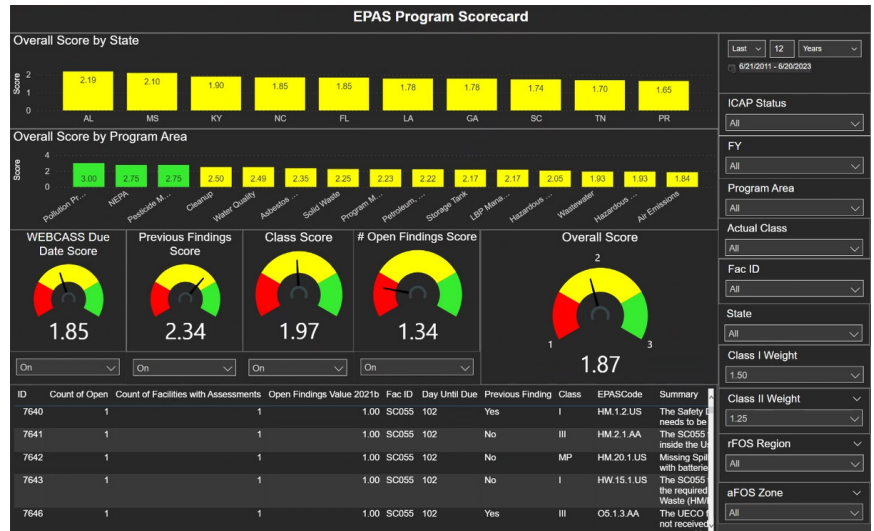
Mitigating Organizational Knowledge Loss

To address historical organizational knowledge loss, a current status of the inventory of the assets in some of the media areas is presented.

In the Drinking Water Data Analytics Dashboard (Figure 3), the locations of required backflow preventers are displayed. The 81st RD did not have an accurate database of all backflow preventers, as there are multiple

Figure 3. Drinking Water Data Analytics Dashboard

backflow preventers in each building on the numerous sites, and a complete list had not been assembled. In addition, previous facility construction plans and site-specific lists were not always handed over during command changes.
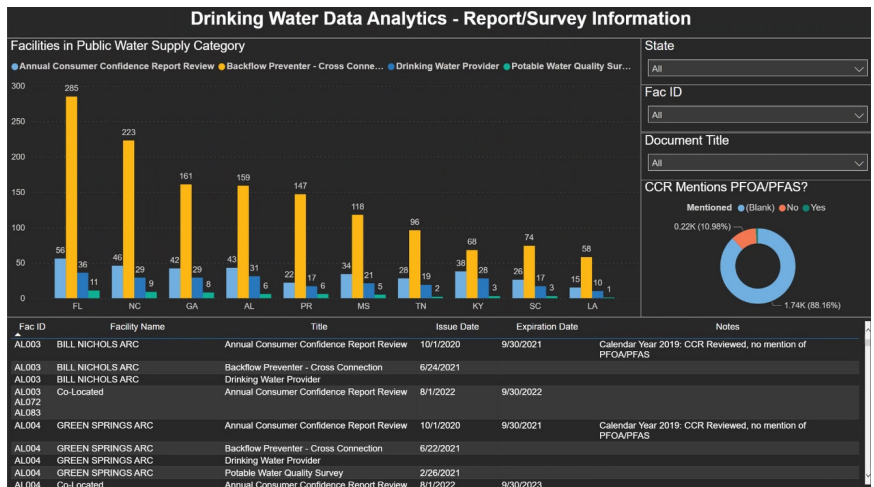
As this data was collected over the past couple of years, the dates that backflow preventers were known to have been serviced was documented. The 81st RD was able to identify from this predictive data analysis that maintenance for a number of facility backflow preventers could not be documented for over 1,000 days. While the 81st RD was aware that some backflow preventers might not have been documented or serviced recently, the depth and breadth of the issue were brought to light with the predictive data analytics.

The success is that the predictive analysis informed the 81st RD of the issue so that leadership support via funding could be obtained. The 81st RD has since started the process to contract with a firm to complete the service inspections and then the service activities (if any are needed). 100% of the 81st RD backflow preventers are scheduled to be inspected by FY24.

✓ **Meets Technical Merit Criteria**

Federal agencies are required to identify, evaluate, and nominate historic properties under agency control to the National Register of Historic Places. The DoD requires each installation to prepare a cultural resource management plan every 5 years to satisfy this requirement. The plan includes an inventory of properties that are listed on or are eligible for listing on the National Register of Historic Places, as well as an evaluation of properties that will reach 50 years of age during the time period covered by the plan. Therefore, the information about each facility's age is important to know so that the facility is included in the cultural resource management plan, as required.

The Cultural Resources Analytics Dashboard presents the status of resource surveys and the locations of known resources at 81st RD facilities (Figure 4). There is also a tracker to alert the 81st RD when a facility is approaching the 50-year life span.
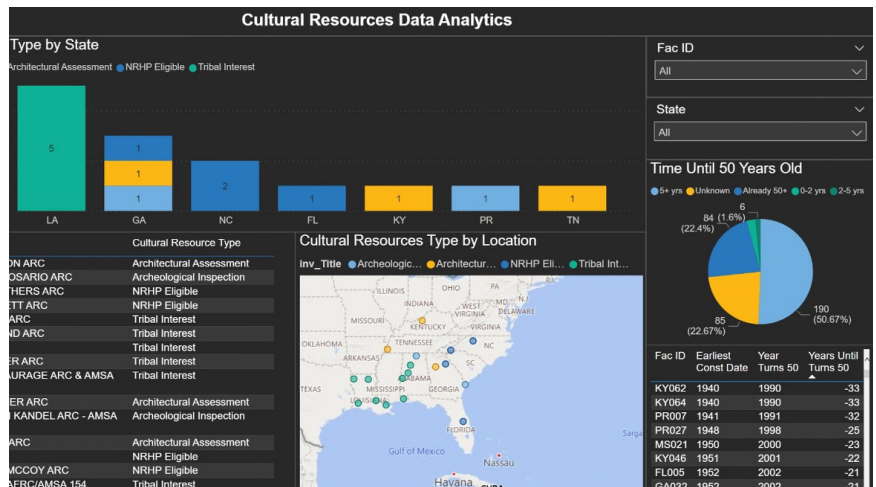

Figure 4. Cultural Resources Analytics Dashboard

The success is that the predictive analysis informed the 81st RD which facilities have cultural and natural resources so that compliant decisions about new construction, for example, can be made quickly and with planning to avoid disturbing these resources. Further, while leadership support (funding or staffing) is not needed at this time, it could be summoned in the future when surveys are needed or facility declarations are necessary when a facility is 50 years old.
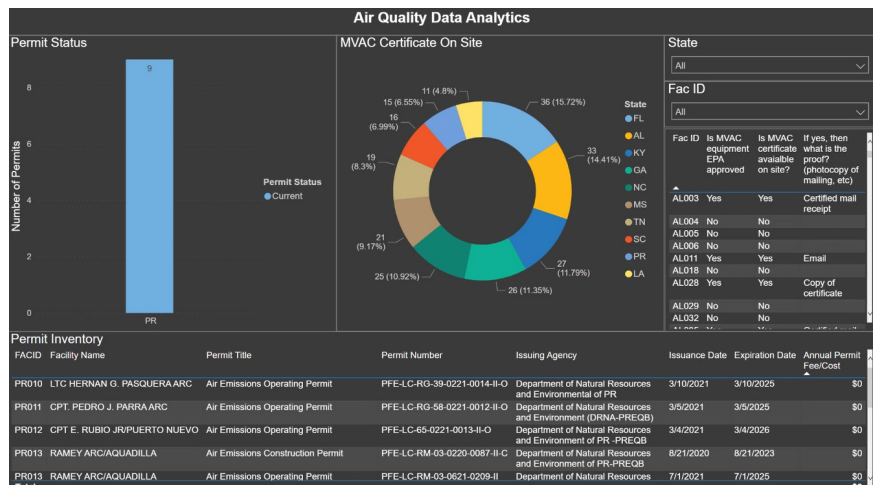

Figure 5. Air Quality Data Analytics Dashboard

Mitigating Compliance Risk and Organizational Knowledge Loss

To address both compliance risk and historical organizational knowledge loss, for example, the Air Quality Data Analytics Dashboard (Figure 5) presents the status of the air permit associated with the emergency generators at 81st RD facilities (compliance), along with the number of certifications for motor vehicle air conditioning servicing at each 81st RD facility (organizational historical knowledge loss). Without this information, staff

would not have easy access to the locations and numbers of these very important facility components. Without these dashboards, 81st RD staff would have to make multiple phone calls, send several emails, and locate the respective management plans in an effort to attempt to piece together this information to provide a vague, incomplete picture of the information.

The success is that the predictive analysis informed the 81st RD of facility, state, and 81st RD-wide issues, instead of just each individual finding. This will allow the 81st RD to implement different compliance strategies for a facility, a state, or the entire RD based on trends observed through the EPAS data analytics.

In addition, the dashboard identifies open findings that could also be identified as a violation for a regulator. When the dashboard was first set up, there were over 3,000 open/in progress findings. At a conservative $1,000 per fine/finding, this could amount to $3 million. **The success is that the predictive analysis informed the 81st RD of the issue, and the 81st RD understands the potential financial impact so that leadership support via funding to address the open findings could be requested.**

Over time, it is expected that the individual 81st RD data analytics highlight issues that can then be corrected so that environmental regulatory compliance can be improved. A baseline was developed so that future findings can be evaluated for trends.

RESULTS

The predictive data analytics system has been a success by giving the 81st RD and facility personnel more insight into contract requirements and data gaps, providing leadership with justification for requesting funding needed to implement improvements in the 81st RD environmental programs.

The 81st RD is building an organization that will have an understanding of their large geographic footprint distributed over 10 states and have the ability to maintain institutional knowledge even with personnel turnover. Predictive data analytics are quickly becoming the foundation where even new staff have standard knowledge of requirements as if they have been with the 81st RD for decades.

The objective is compliance with environmental regulations and continual improvement in both compliance and management. The 81st RD predictive data analytics system provides an emotion-free examination of the data to highlight issues so that critical problems are identified and brought to the attention of leadership early, before they become urgent. This success has been achieved in some of the 81st RD's compliance areas.

✓ **Meets Transferability Criteria**

This type of data analysis system might have applicability at other geographically distributed landholding government agencies, such as the Bureau of Prisons, the General Services Administration Public Building Service, and various military departments in the DoD. These organizations could benefit from access to the decision criteria used and the implementation plan developed as each tailors their environmental program to fit its unique environment.