Project Investment Justification

Version 01.01

A Statewide Standard Document for Information Technology Projects

Project Title: myDEQ Phase 2	

Agency Name:	**Arizona Department of Environmental Quality**
Date:	**May 16. 2014**
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Agency Contact Phone:	
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Hover for Instructions

I.   Management Summary*

Arizona Department of Environmental Quality (ADEQ) is currently developing myDEQ, a web portal that will enable its customers to do permitting, billings and payments and data submission online. myDEQ will benefit over 18,000 businesses across Arizona. Currently, ADEQ conducts most of its business with its customer using manual processes. It receives permit applications, bill pay, notifications, and compliance data via paper form for roughly 140 different business process types. These paper processes require non-value added time on the part of both ADEQ customers and ADEQ staff. Elapsed time from the customer beginning their paper creation to receiving final answer from ADEQ ranges from weeks to months. ADEQ anticipates savings in elapsed time ranging from 75 to 95% for each business process by implementing these processes on-line via a customer portal. A reduction in elapsed time to permitting decisions lets the regulated community make quicker decisions which not only helps the economy but also helps us in keeping the environment clean.

During myDEQ Phase 1, ADEQ built the foundational infrastructure required to deliver the customer portal including:
- Development, QA, Integration, UAT, Beta and Production Environments (135 virtual machines)
- WSO2 integration
- Purchased, installed and integrated technology stack (SVN, Jenkins, Sonatype Nexus, Selenium, RallyDev, Soap UI Pro, SQL Navigator, PL/SQL Developer, Toad, Rational Software Architect, Puppet, Serena PVCS, etc.)
- Service Oriented Architecture
- User interface style guide
- Working code for 209 user stories, schedule to be delivered by 6/30/14

In this PIJ, we are requesting approval for the next phase of myDEQ to expand the myDEQ portal by including additional customer functionality and business processes.

“The completion of this project, with its cost savings, convenience, and compliance assistance, will be a boon to business regulated by ADEQ and help attract new business to Arizona.”
- Governor Brewer, *Building on the Four Corners of Reform*, January 2013

II.   Project Investment Justification (PIJ) Type*

☐ **Yes** ☒ **No**   Is this document being provided for a Pre-PIJ / Assessment phase?

If Yes,

Identify any cost to be incurred during the Assessment phase.	$
Based on research done to date, provide a high-level estimate or range of development costs anticipated for the full PIJ.	$

Explain:
Click here to enter text.

☐ **Yes** ☒ **No**   Will a Request for Proposal (RFP) be issued as part of the Pre-PIJ or PIJ?

III. Business Case

A. Business Problem*

ADEQ processes roughly 28,000 transactions annually via paper form for various permits, reports, and receives payments from roughly 16,000 facilities. This causes ADEQ and the regulated community to enter the data multiple times, increased amount of re-work, and manual reporting. All of this manual effort is error prone and time consuming. This results in permits taking too long to issue, an increased number of facilities out of compliance, and an inefficient process for our customers.

As shown in Figure III.A.1 below, it can take as many as 3 months to issue a permit, a report or a notification to our customers. Our customers are clearly unsatisfied with these delays as they negatively impact their businesses. Furthermore, the touch time for these permits and notifications are unusually high. For example, ADEQ handles about 4000 invoices and payments every year and it takes about 2 FTE hours per transaction. This equates to more than 4 FTEs engaged full time in handling invoices and payments. For the most part, this is non-value added time spent by ADEQ staff.

Process	Est. Annual Count	Elapsed Time (Days)	Touch Time (Hours)	Value Added Ratio (%)
		Current	Current	
Payments – View & Pay Bills, View Invoice Transaction History	4,000	84	2	0.099%
Crushing and Screening (C&S) – Get ATO & FOG, Terminate ATO, Automate Emissions Calculations	26 to 50	89	7	0.328%
Crushing and Screening (C&S) – Submit Compliance Certification	251 to 500	34	2.5	0.306%
RCRA – New EPA ID, Edit EPA ID, Deactivate EPA ID, View Detail EPA ID	100 to 250	82	5	0.254%
Self-Monitoring Report Form (SMRF) – Upload SMRF, Search and View Data and Receive Validation Report	2,400 reports with a total of 1,000,000 data points	67	2	0.124%
Hot Mix Asphalt – Get ATO & FOG, Terminate ATO, Automate Emissions Calculations	26 to 50	89	7	0.328%
Hot Mix Asphalt, Submit Compliance Certification	251 to 500	34	2.5	0.306%

Figure III.A.1 – Elapsed and Touch Time per transaction per process

B. Proposed Business Solution*

This is a continuation of myDEQ Phase 1 which was initially proposed in ADEQ's executive budget request (EBR) submitted in September 28, 2012 and subsequently submitted to ASET in a PIJ on October 4, 2013. ADEQ also sought and received approval from ITAC on October 23, 2013, and favorable review from the Joint Legislative Budget Committee (JLBC) on October 29, 2013. Because this PIJ is a continuation of an existing project, this section is divided in two subsections: Progress to Date and Next Steps.

Progress to Date

The Phase 1 PIJ proposed to add 27 business processes to the portal by June 30, 2014, using an Agile/SCRUM methodology and four (4) Sprint teams working simultaneously. The Phase 1 PIJ was prepared after significant progress had been made on the self-monitoring report form (SMRF) pilot but before user acceptance testing (UAT) had been conducted. While working with internal and external customers during UAT, ADEQ learned some very important lessons:

(1) We did not anticipate the effort necessary to develop and host externally facing web applications that functioned appropriately through the WSO2 service bus. WSO2 is relatively new, open-source middle-ware package that few State or private sector IT professionals are familiar with. When attempting to deploy UAT for external testers, these challenges became visible. ADEQ has engaged WSO2 support extensively during Phase 1 to resolve numerous challenges and has successfully integrated WSO2 in UAT, beta and production environments.

(2) The original Phase 1 business process estimate assumed very basic services for each business process. During UAT, we learned that deeper and expanded functionality within each business process was desired by end-users. For example, the business process called "SMRF" in the PIJ envisioned only very basic upload capability. After UAT, SMRF has evolved to include:

- Upload SMRF
- Search and View Data
- Receive Validation Reports
- Receive Alerts

(3) Fillable forms (what we did during the pilot) are easy to program and deploy but do not deliver the desired user experience and error mitigation. The difference in the user experience is analogous to using the Internal Revenue Service's online forms versus using TurboTax. In short, after UAT for the pilot (January 2014), it became very clear that the limited functionality available through on-line forms is not desirable. Based on internal and external feedback we determined that our customers will be better served by developing deeper functionality within each business process - even if that meant delivering fewer business processes. As in the case of TurboTax, the number of user screens, the granularity of user stories, and the difficulty associated with programming is much greater when delivering a guided tour that also minimizes user errors.

The table below summarizes the increased complexity for ADEQ business processes:

Original Business Process	User Experience			
	On-line Forms		Guided Tour with Error Mitigation	
	No. of Screens	User Stories	No. of Screens	User Stories
SMRF	5	12	36	43

Based on the lessons learned cited previously, ADEQ will deliver the following business processes by June 30, 2014:

Business Processes – Phase 1 Releases 1 & 2
Payments – QuickPay
Customer - Create Account Express
Customer - Create Account Standard
Customer - Validate Account
Customer - Receive Cromerr Certification
Customer - Create User Roles
Customer - Manage Mailing Preferences
Customer – Login / Logout
Customer – Change / Reset Password
Landing Page – Site Navigation
Landing Page - View My Stuff
SMRF - Upload SMRF
SMRF - Receive Validation Reports

In addition, ADEQ will have accomplished the following during myDEQ Phase 1 project (EV14003):

- Setup the infrastructure for multiple environments (135 virtual machines)
  - Development Environment
  - QA Environment
  - Integration Environment
  - UAT Environment (clustered)
  - Beta Environment (clustered)
  - Production Environment (clustered)
- Tested and integrated the above environments with WSO2
- Trained ADEQ staff so that they can better perform the role of Product Owners
- Streamlined the process of collecting user requirements and developing mockups

- Conducted an Independent Third-party Audit and devised a plan to implement the recommendations

*It is noteworthy that the above work will have been completed in **8 months** (November 2013 through June 2014). Although the lessons learned were significant, what differentiates this project from others is how fast adjustments were made.*

Next Steps

ADEQ is proposing to take advantage of the momentum and lessons learned through the myDEQ Phase 1 effort by immediately starting myDEQ Phase 2 on July 1, 2014. The Phase 2 scope takes in to consideration the lessons learned in Phase 1 and prioritizes a much more functional and user-friendly list of business processes.

The following table outlines the 22 business processes planned for delivery in Phase 2:

Business Processes – Phase 2
Customer - Manage Account
Landing Page – View SMRF Alerts
View Bills
Pay Bills
View Invoice Transactions History
C&S - Get ATO and FOG
C&S - Terminate ATO
C&S - Submit Compliance Certification
C&S - Automate Emissions Calculations
RCRA - Get New EPA ID
RCRA - Edit EPA ID Registration Information
RCRA - De-activate EPA ID
RCRA - View Detail EPA ID
Landing Page – View My Notices
Hot Mix Asphalt - Get ATO and FOG
Hot Mix Asphalt - Terminate ATO
Hot Mix Asphalt - Submit Compliance Certification
Hot Mix Asphalt - Automate Emissions Calculations
Concrete Batch Plant - Get ATO and FOG
Concrete Batch Plant - Terminate ATO
Concrete Batch Plant - Submit Compliance Certification
Concrete Batch Plant - Automate Emissions Calculations

In addition, ADEQ will continue having an independent third party review the progress of the project. In myDEQ Phase 1 Project (FY14), ADEQ contracted an independent vendor to assess the technical and financial feasibility of the project. ADEQ will continue doing this review on a quarterly basis in FY15. Results of the review will be provided to ASET and JLBC (in additional to the monthly status reports).

C.   Quantified Benefits*

X	Service enhancement
	Increased revenue
X	Cost reduction
X	Problem avoidance
X	Risk avoidance

Explain:

After carefully evaluating its current processes, ADEQ streamlined each transaction (introduced LEAN) and then estimated the future elapsed and touch time assuming that the future processes of permitting and compliance reporting will be done through the myDEQ portal. The estimated elapsed time and touch time show a dramatic increase in efficiency. Permits that now take 90 days to issue can be done in almost real time (in one day). The touch time (ADEQ's staff time) that currently takes seven (7) hours per permit will reduce to six (6) minutes. Please see Figure III.C.1 below for some of the processes that have already gone through ADEQ's LEAN process.

Transactions	Est. Annual Count	Elapsed Time (Days)		Touch Time (Hours)		Savings*
		Current	Future	Current	Future	
Payments – View & Pay Bills, View Invoice Transaction History	4,000	84	35	2	0.1	5.7
Crushing and Screening (C&S) – Get ATO & FOG, Terminate ATO, Automate Emissions Calculations	26 to 50	89	1	7	0.1	0.2
Crushing and Screening (C&S) – Submit Compliance Certification	251 to 500	34	2	2.5	0.1	0.7
RCRA – New EPA ID, Edit EPA ID, Deactivate EPA ID, View Detail EPA ID	100 to 250	82	1	5	0.25	0.6
Self-Monitoring Report Form (SMRF) – Upload SMRF, Search and View Data and Receive Validation Report	2,400 reports with a total of 1,000,000 Data Points	67	14	2	0.25	3.1
Hot Mix Asphalt – Get ATO & FOG, Terminate ATO, Automate Emissions Calculations	26 to 50	89	1	7	0.1	0.2
Hot Mix Asphalt, Submit Compliance Certification	251 to 500	34	2	2.5	0.1	0.7
TOTAL						11.20

Figure III.C.1 – Elapsed and Touch Time per transaction per process – Current and Future

Savings*: this column shows that the increased efficiency will result in fewer FTE used for the same output. In just these 7 transactions, ADEQ will free up more than 11 FTEs to perform other value-added work. Calculation assumes 1,344 hours (~75% burden) equals one FTE.

Who will benefit from myDEQ?

Arizona's air, land and water will benefit – Better, more convenient tools means better environmental compliance. Ohio saw a 90% drop in violations after implementing an on-line Self-Monitoring Report Form (SMRF).

The Citizens of Arizona will benefit – this system will provide much more convenient access to public records and environmental information to all taxpayers.

All State agencies will benefit – ADEQ is working with the Arizona Strategic Enterprise Technology Office (ASET) to pilot Arizona's e-governance initiative. myDEQ will be the pilot for all State agencies. The various phases of this project will be competed amongst top private sector companies with specific e-government experience and will have rigorous oversight by the ADOA/ASET and ADEQ.

IV.   Technology Approach

A.   *Proposed Technology Solution**

We will continue using the architecture as designed and developed in the myDEQ Phase 1 project. This architecture was developed in consultation with ADOA and WSO2 architects. Our technical architecture is detailed in the attached Software Architecture Document (Appendix III B.2).

In FY15, we will be purchasing the following hardware and professional & outside services to support myDEQ web portal:

Consultants / Contractors (FY15) Professional & outside Services: This is required to continue adding business processes to the myDEQ Portal in FY15. We are estimating to spend $6.7 million in FY15 for consultants through the two statewide contracts, Knowledge Services (Staff Augmentation) and ADOA's Digital Government Contracts. Refer to Attachment 1, for the current Team Structure for additional detailed information. The current team structures will be evaluated at the end of myDEQ Phase 1 Project and changes will be implemented as deemed necessary at that time.

Third Party Review (IV&V): ADEQ will continue to engage an independent third party vendor to assess the progress of the project on a quarterly basis. We are estimating to spend $25,000 per quarter for this effort.

WSO2 Production Support (1 Year): ADEQ will engage WSO2 to provide production support for 1 year in FY15. The cost for 1 year of Production support is $200,000. In subsequent years, we are expecting to partner with ADOA to leverage their hosting services. The cost for these shared services are yet to be determined. These should be substantially lower than $200,000 per year.

XIO Primary Storage for VM Operating Systems: This is needed to store all of the Virtual Machines that make up the myDEQ system. This storage must be tier 1 storage because we are using virtualization and high IOPS are required for acceptable access speeds. The estimated cost for purchasing the storage is $93,000.00.

Cisco UCS Chassis and Blade server: This is required to host the virtualization platform (VMware) that runs the Linux virtual machines that in turn run the myDEQ system. This should be separated from the other hosts that run the agency's main network servers to allow for better performance. The estimated cost for this is $44,750.00.

Oracle Linux Basic Limited Support: This is required in order to be able to contact Oracle for technical support in the event that we have a problem with any of the production Linux servers hosting the myDEQ system. The estimated cost for Oracle Linux Support is $22,455.00 per year.

B.   *Technology Environment*

Below is a summary of some of the key components of our technical environment:

- The environment constitutes of multiple Linux Virtual Machines running the WSO2 Components in a single or clustered manner. The Web application will be deployed on WSO2 Application Server. The development environments will continue using Local WSO2 Carbon Server for testing.
- The consumer can be our deployed application running on a desktop, tablet or a web enabled device or a customer's application accessing our services via API.
- The backend is the AZURITE database (Oracle 11g) running on Exadata.
- Identity management, authentication and authorization will be handled by the Amazon EC2 ADOA deployed DEQ instance. ADEQ's Identity Server will be a tenant on ADOA's server.
- WSO2 G-REG is used to implement and manage SOA lifecycle –develop, test, deploy and retire and to automate deployment to each environment using an SVN synchronization method.
- Subversion running on HTTP is used for source control and versioning.
- Jenkins running on HTTP is used for Continuous Integration Testing to ensure Build Integrity and Stability and to support Agile Development process.
- Sonatype Nexus is used for managing, storing, versioning product dependencies and artifacts.
- SoapUI Pro is used to test web services, automated web service testing, and load testing of web services
- Selenium test cases and framework is built to automate application QA and regression testing.

- RallyDev is used to manage our Agile/Scrum development process. Our product owner's vision is captured and a roadmap to its realization is planned by the way of multiple projects. Each project will be associated to the product backlog. With each sprint planning session, the development team will move a certain amount of work to the sprint backlog and tasks it out. All sprint related tasks will be captured, designed, managed and tracked in RallyDev and the daily scrum will keep the team on track for a proper burn-down.
- Rational Software Architect is used to model the Enterprise Architecture and high level technical design models will be built using this tool. These high level design will be further refined for implementation by the development team.
- Other tools and software that will utilized for myDEQ project will be Oracle SQL Developer, SQL Navigator, ERWin Data Modeler, Microsoft Visio, SharePoint and Microsoft Project Server.

C.   *Selection Process*

ADEQ is currently using consultants through two statewide contracts, Knowledge Services (staff augmentation) and ADOA's Digital Government Contracts. ADEQ will continue using these two contracts for myDEQ Phase 2 Project.

V. Project Approach

In order to estimate the number of business processes that could be completed in FY15 (deliverables of this PIJ), ADEQ used the following method:

- Developed an average unit cost per user story based on Phase 1 expenditures,
- Estimated the average cost per business process by evaluating each transaction's difficulty relative to SMRF,
- Estimated the number of business processes that could be completed based on the available funding for FY 15 and the average cost per transaction

The schedule was similarly estimated by assuming that the project team could deliver an average of 20 user stories per 2-week sprint.

A. Project Schedule*

Project Start Date: 7/1/2014   Project End Date: 6/30/2015

B. Project Milestones

There will be two Production Releases by the time we finish myDEQ Phase 1 Project on June 30, 2014. During myDEQ Phase 2 project we are planning to have between four and six production releases. While exact dates and content of these releases may vary, the table below shows our current projections of the milestones.

Major Milestones	Business Processes	Start Date	Finish Date
myDEQ Release 3	Customer – Manage Account; View Bills, Pay Bills, View Transaction History	7/1/2014	9/19/14
myDEQ Release 4	RCRA – Get New EPA ID Edit EPA ID, De-activate EPA ID, View Detail EPA ID, Landing page – View SMRF Alerts	9/20/2014	11/28/2014
myDEQ Release 5	Crushing and Screening (C&S) – Get ATO & FOG, Terminate ATO, Submit Compliance Certifications, Automate Emissions Calculations	11/29/2014	2/13/2015
myDEQ Release 6	Hot Mix Asphalt – Get ATO & FOG, Terminate ATO, Submit Compliance Certifications, Automate Emissions Calculations	2/14/2015	5/1/2015
myDEQ Release 7	Concrete Batch Plant – Get ATO & FOG, Terminate ATO, Submit Compliance Certifications, Automate Emissions Calculations; Landing Page – View My Notices	5/2/2015	6/30/2015

VI. Roles and Responsibilities

A. Project Roles and Responsibilities

Name	Title	Project Role/Responsibility
Henry Darwin	ADEQ Director	Executive Sponsor
Misael Cabrera	ADEQ Deputy Director	Project Sponsor
Gary A. Heller	Chief Information Officer	Technical Project Sponsor
Khursheed Mallick	ISDU Manager	Project Manager
Ryan Richards	Environ. Engineer Specialist	Business Lead
David Lelsz	Admin. Services Officer	Water SME
Balaji Vaidyanathan	Section Manager	AIR SME
Robin Thomas	Section Manager	Waste SME
Teena Ziegler	Chief Procurement Officer	Procurement

B. Project Manager Certification

[X] Project Management Professional (PMP) Certified
[ ] State of Arizona Certified
[ ] Project Management Certification not required

C. Full-Time Employee (FTE) Project Hours

Total Full-Time Employee Hours	8,200
Total Full-Time Employee Cost	$

VII. Risk Matrix, Areas of Impact, Itemized List, PIJ Financials

VIII.   Project Approvals

A.   Agency CIO Review*

Key Management Information	Yes	No
1. Is this project for a mission-critical application system?	X	
2. Is this project referenced in your agency's Strategic IT Plan?	X	
3. Is this project in compliance with all agency and State standards and policies for network, security, platform, software/application, and/or data/information as defined in http://aset.azdoa.gov/security/policies-standards-and-procedures, and applicable to this project? If **NO**, explain in detail in the "XI. Additional Information" section below.	X	
4. Will this project transmit, store, or process sensitive, confidential or Personally Identifiable Information (PII) data? If **YES,** in the "XI. Additional Information" section below, describe what security controls are being put in place to protect the data.		X
5. Is this project in compliance with the Arizona Revised Statutes (A.R.S.) and GRRC rules?	X	
6. Is this project in compliance with the statewide policy regarding the accessibility to equipment and information technology for citizens with disabilities?	X	

B.   Project Values*

The following table should be populated with summary information from other sections of the PIJ.

Description	Section	Number or Cost
Assessment Cost **(if applicable for Pre-PIJ)**	II. PIJ Type - Pre-PIJ Assessment Cost	$
Total Development Cost	VII. PIJ Financials tab	**$7,128,045.58**
Total Project Cost	VII. PIJ Financials tab	**$7,280,595.98**
FTE Hours	VI. Roles and Responsibilities	**8,200**

C.   Agency Approvals*

Contact	Printed Name	Signature	Email and Phone
Project Manager:	Khursheed Mallick		
Agency CIO:	Gary A. Heller		
Project Sponsor:	Misael Cabrera		
Agency Director:	Henry Darwin		

IX.   Optional Attachments

A.   *Vendor Quotes*

Attachment 1 – Current Team Structure

Quote - Oracle Linux Basic Limited Support 5119900_Arizona Dept of Environmental_v2.pdf

Quote - CISCO UCS Chasis - AZ DEQ 5108 w B200v2 5-15-141.xlsx

Quote - XIO Primary Storage - TCCQBudget_DEQ_ISE240QTY2_MAY2014.pdf

B.   *Software Architecture Document*

Appendix III B.2 - Software Architecture Document (SAD) - Draft.pdf

X.   Glossary

XI.   Additional Information

Links:

ADOA-ASET Website

ADOA-ASET Project Investment Justification Information Templates and Contacts

Email Addresses:

Strategic Oversight

ADOA-ASET_Webmaster@azdoa.gov