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# FAX COVER SHEET

— TECHNICAL PROPOSAL —

Solicitation No.: CRFP 0313 DEP2600000003

Bid Opening Date: 5/27/2026 @ 1:30 PM ET

6-10-26

TO:	WV Department of Administration, Purchasing Division
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CONTENTS: Technical Proposal for WV DEP E-Permitting System — UIC Class 1 & Class 6. This document contains NO cost information.

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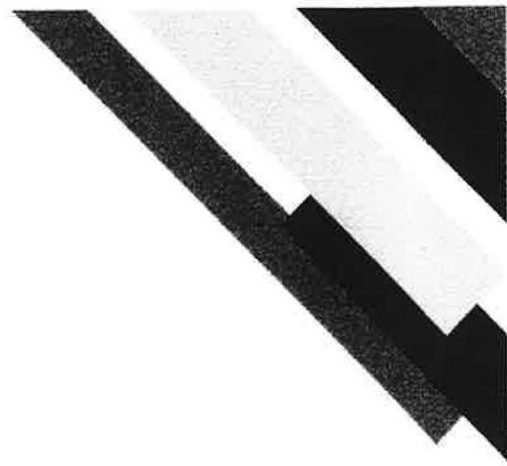
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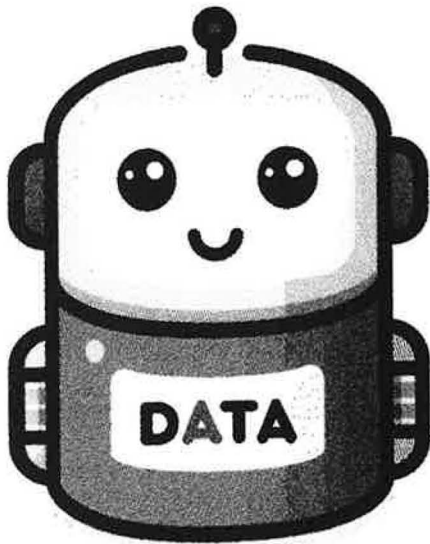
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Technical Proposal  
Workflow Based Agentic AI, Automation,  
and E-Permitting System

CRFP 0313 DEP2600000003  
Vendor Code: VS0000052358  
27 May 2026



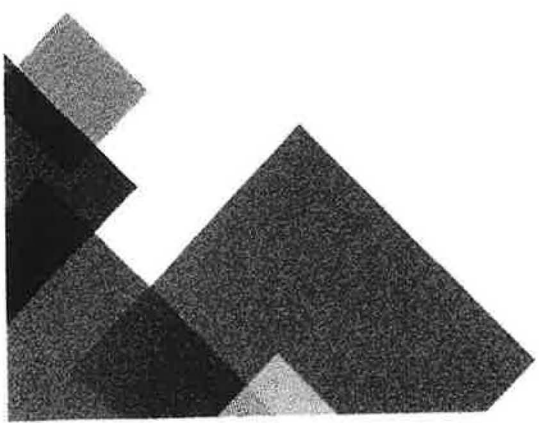
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**COMPLIANCE MATRIX**

RFP Section	Requirement Description	Proposal Section	Compliance Status
4.3.1	Goals and Objectives	Section 4.3.1	✓ Compliant
4.3.2.1	General Automation and Dashboard Integration	Section 4.3.1.A	✓ Compliant
4.3.2.2	UIC Class I and Class VI Agentic AI Processing	Section 4.3.1.B	✓ Compliant
4.3.2.3	Geospatial Analysis and GIS Integration	Section 4.3.1.C	✓ Compliant
4.3.2.4	Document Processing and AI Drafting	Section 4.3.1.D	✓ Compliant
4.3.2.5	Workflow Integration	Section 4.3.1.E	✓ Compliant
4.3.2.6	AI Token Usage and Cost Management	Section 4.3.1.F	✓ Compliant
4.3.2.7	HITL Workflow Interface and Legacy System Independence	Section 4.3.1.G	✓ Compliant
4.3.3.1	Data Integration and Regulatory Compliance	Section 4.3.3.A	✓ Compliant
4.3.3.2	Security and Deployment	Section 4.3.3.B	✓ Compliant
4.3.3.3	Support and Maintenance	Section 4.3.3.C	✓ Compliant
4.3.3.4	Licensing	Section 4.3.3.D	✓ Compliant
4.3.3.5	Regulatory Compliance	Section 4.3.3.E	✓ Compliant
4.3.3.6	Data Ownership and Exit Strategy	Section 4.3.3.F	✓ Compliant
4.4.1	Qualification and Experience Information	Section 4.4.1	✓ Compliant
4.4.2	Mandatory Qualification/Experience Requirements	Section 4.4.2	✓ Compliant



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**TITLE PAGE**

**RFP Subject:** Workflow Based Agentic AI, Automation, and E-Permitting System for Underground Injection Control (UIC) Class I and Class VI Permitting

RFP Number: CRFP 0313 DEP2600000003

Vendor Code: VS0000052358

**Vendor Name: Data Machines**

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**Principal Research Engineer / Lead AI Architect — Philip A. Sage**

Role: AI/ML architecture leadership, multi-agent orchestration design, GraphRAG pipeline development, knowledge graph construction, and technical oversight of all AI engineering activities.

Experience: 30+ years in AI/ML, multi-agent systems, and data fusion across DARPA, NGA, IARPA, and DoD. Phil served as Chief AI Architect at Johns Hopkins University Applied Physics Laboratory, leading SOCOM autonomy programs and supporting CDAO Task Force LIMA for responsible DoD AI implementation. He served as NGA Analytic Technologies Office Director through the Intergovernment Personnel Act, guiding R&D portfolios across the IC. At Data Machines, Phil leads the ADMIRAL agent-based decision-support framework for naval C2 — the direct technical predecessor to the Data Machines Agentic AI E-Permitting System



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architecture. Education: M.S. Information Systems, M.S. and B.S. Electrical & Computer Engineering (George Mason University); Ph.D. Computational Sciences & Informatics (George Mason University, in progress). Phil will remain assigned to this project for its duration.

Phone: (703) 863-0487

Email: [lindsaymercerc@datamachines.com](mailto:lindsaymercerc@datamachines.com)

Authorized Signature:

A handwritten signature in cursive script that reads "Lindsay Mercer". The signature is written in black ink and is positioned above a horizontal line.

Date: May 27, 2026



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**EXECUTIVE SUMMARY**

*WVDEP gets a production-ready agentic AI system built by the team that delivered autonomous document processing for the Office of Naval Research — not a prototype, not a pilot, but a system engineered for regulatory compliance from day one.*

WVDEP's Underground Injection Control program faces a critical operational challenge. UIC permit reviewers currently spend 4-6 hours manually cross-referencing each 500-1,500 page application against 40 CFR Part 146 requirements before substantive technical review can begin. Geologists perform Area of Review analysis manually, with no automated well proximity detection — a process that can consume a full day for a single complex application. As national carbon capture and sequestration initiatives accelerate, Class VI permit applications are increasing, but WVDEP's review bandwidth remains constrained. Meanwhile, critical permitting data is fragmented across siloed legacy systems — AppEnhancer for document management, ERIS for environmental data, and ESS for electronic submissions — with no automated workflow connecting them.

Data Machines (DMC) solves this with the Data Machines Agentic AI E-Permitting System, a purpose-built agentic AI platform designed specifically for UIC Class I and Class VI permit processing. Unlike generic e-permitting platforms that treat AI as an add-on, our system was architected from the ground up for environmental regulatory compliance — built by the team that delivered autonomous document processing for the Office of Naval Research and real-time streaming analytics for DARPA.

**Our Understanding of Your Challenge**

WVDEP seeks to modernize the UIC permit review process through advanced agentic AI while maintaining strict regulatory compliance, ensuring data security, and preserving human oversight at critical decision points. The system must handle complex geospatial analysis, multi-format document processing, and seamless integration with existing legacy systems without disrupting current operations.

**Data Machines' Solution: Data Machines Agentic AI E-Permitting System (Agentic AI E-Permitting System)**

DMC proposes Data Machines Agentic AI E-Permitting System, a purpose-built agentic AI platform specifically designed for environmental regulatory compliance.

**Key Differentiators:**

Production-Ready Agentic AI: DMC builds agentic systems, not COTS software. Our ONR DocAssist contract demonstrates our ability to deploy LLM-powered document authoring with RAG, fine-tuning, and multi-agent workflows in production environments.



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**Regulatory Domain Expertise:** Our team includes environmental engineers and geoscientists who understand UIC regulations. We propose embedding a dedicated UIC subject matter expert (SME) and encoding 40 CFR Part 146 directly into the compliance engine.

**FedRAMP-Ready Security:** Hosted on AWS GovCloud with FedRAMP Moderate authorization, ensuring compliance with federal security requirements while maintaining data sovereignty within the continental United States.

**Legacy System Preservation:** Our standalone HITL Workflow Interface operates independently from your existing systems, eliminating integration risks while enabling AI-assisted workflows.

**Transparent AI Operations:** AgentOps observability provides complete “Chain of Thought” logging for every decision, ensuring legal defensibility and regulatory audit compliance.

**Expected Outcomes:**

60-80% reduction in administrative completeness review time

40-50% reduction in technical compliance analysis duration

90%+ accuracy in automated deficiency identification

Complete audit trail for all AI decisions and human interventions

Seamless scaling to handle projected 2-20 applications per year with capacity for growth

**Investment Protection:** Our solution is designed for long-term partnership with built-in adaptability for evolving AI capabilities, regulatory changes, and growing permit volumes.

**Why This Matters:** WVDEP is not buying software — WVDEP is engaging an AI engineering team that builds the solution around WVDEP's specific UIC permitting requirements.

**SaaS Delivery Model (4.2)**

Data Machines Agentic AI E-Permitting System is delivered as a fully managed cloud-based Software as a Service (SaaS) solution hosted on AWS GovCloud with FedRAMP Moderate authorization. WVDEP end users access all system capabilities — including the HITL workflow interface, executive dashboard, permit tracking portal, and administrative tools — via secure web browsers over HTTPS. DMC manages all infrastructure, updates, security patching, and system maintenance, eliminating the need for WVDEP to provision or maintain any on-premise hardware or software. The SaaS model ensures WVDEP always operates on the latest version with continuous improvements deployed through managed release cycles. The platform guarantees 99.9% availability excluding scheduled maintenance windows, backed by contractual SLAs covering uptime, performance, incident response, and support.

**SECTION 4.3.1**

Approach & Methodology to Goals/Objectives



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*WVDEP's staff interact with a single intuitive dashboard that puts permit status, AI decisions, and system health at their fingertips — eliminating the need to check multiple legacy systems.*

#### **A. General Automation and Dashboard Integration (4.3.2.1)**

##### **DMC's Agentic AI Platform Architecture**

Data Machines proposes a sophisticated multi-agent architecture built on our proprietary AgentOps framework, specifically designed for regulatory compliance workflows.

##### **System Automation/Integration (4.3.2.1.1)**

WVDEP's integration strategy leverages a modular microservices architecture that interfaces with existing operational software through secure APIs and data exchange protocols:

**Event-Driven Integration:** Real-time webhook notifications and message queues enable seamless data flow between Data Machines Agentic AI E-Permitting System and WVDEP systems

**Secure API Gateway:** All external integrations pass through our certified API gateway with OAuth 2.0 authentication and rate limiting

**Data Translation Layer:** Automatic format conversion and schema mapping for legacy system compatibility

**Error Handling & Retry Logic:** Robust failure recovery mechanisms with exponential backoff and circuit breaker patterns

##### **Dashboard Development (4.3.2.1.2)**

WVDEP's web-based dashboard provides comprehensive oversight and control capabilities:

**Executive Dashboard:** Real-time KPIs, permit processing metrics, and system health indicators

**Operations Center:** Live workflow status, queue management, and exception handling

**Audit Interface:** Complete transaction logs, decision trails, and compliance reporting

**Security Features:** Role-based access control (RBAC), multi-factor authentication (MFA), and session management

*Data Machines Agentic AI E-Permitting System doesn't just automate paperwork — it understands UIC regulations. Every permit application is processed by specialized AI agents that know the difference between Class I and Class VI requirements, reducing review time by 60-80% while catching deficiencies human reviewers might miss.*

**Integration Ready:** RESTful APIs for embedding into existing WVDEP web properties with SSO integration

#### **B. UIC Class I and Class VI Agentic AI Processing (4.3.2.2)**

##### **Digital Intake Specialist Functionality (4.3.2.2.1)**



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Data Machines Agentic AI E-Permitting System implements a sophisticated multi-agent orchestration system that functions as an intelligent “Digital Intake Specialist”:

**Agentic Routing and Sub-Workflow Orchestration (4.3.2.2.1.1)**

Data Machines Agentic AI E-Permitting System's dynamic routing engine employs decision trees and machine learning classifiers to:

Primary Classification: Distinguish between Class I and Class VI applications using document structure analysis and keyword detection

Granular Sub-Routing: Deploy specialized agents based on detected application characteristics:

AoR Analysis Agent: Triggered by geospatial data presence

Financial Responsibility Agent: Activated by insurance/financial documents

Corrective Action Agent: Initiated when existing wells are detected in AoR

Construction Standards Agent: Deployed for well design review

**Administrative Completeness Review (4.3.2.2.1.2)**

The completeness engine utilizes advanced NLP and computer vision to verify required documentation: This includes verification of EPA Form 7520-6, facility location and legal descriptions, operator identification, well construction details, injection zone identification, confining zone characterization, and proposed injection parameters.

Structured Document Detection: Machine learning models trained on EPA forms and permit templates

Signature Verification: Computer vision algorithms for Responsible Corporate Officer authentication

Cross-Reference Validation: Automatic verification that project descriptions match across all submitted documents

Progressive Disclosure: Dynamic checklists that adapt based on project type and classification

For Class VI Applications: Specialized agents handle complex documentation including: - Detailed geologic characterization validation - Testing and Monitoring Plan (TMP) completeness verification - Post-Injection Site Care (PISC) Plan adequacy assessment - Financial responsibility documentation validation

Consider a typical Monday morning for a WVDEP UIC permit reviewer. A new Class VI application arrives — 1,200 pages across geological characterization, well construction plans, AoR modeling data, financial responsibility documents, and a Testing and Monitoring Plan. Today, the reviewer manually inventories each document against the 40 CFR 146 Subpart H checklist, a process that takes 4-6 hours before technical review even begins. With Data Machines Agentic AI E-Permitting System, the Digital Intake Specialist processes the entire





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submission in under 30 minutes, produces a structured completeness report with specific citations to missing or incomplete items, and routes specialized components to the appropriate analysis agents — freeing the reviewer to focus on the technical judgments that require human expertise.

#### **Technical Compliance Review (4.3.2.2.1.3)**

The technical analysis engine combines domain expertise with AI capabilities:

Geological Validation: Automated analysis of injection zone properties, confining zone integrity, and USDW protection

*Every AI-generated recommendation is grounded in actual regulatory text and source documents — WVDEP reviewers can click through to the exact citation, eliminating the "black box" problem that plagues generic AI tools.*

Engineering Review: Well construction design validation including casing materials, cementing programs, and operational parameters

Regulatory Cross-Check: Automatic verification against 40 CFR Part 146 requirements and WV state regulations

#### **RAG and Source Grounding (4.3.2.2.2)**

The Data Machines Agentic AI E-Permitting System platform implements GraphRAG (Knowledge Graph Retrieval-Augmented Generation) to provide superior contextual understanding:

Knowledge Graph Construction: Regulatory relationships between federal and state UIC requirements, geological formation correlations, and permit history patterns mapped as traversable graph structures.

Advanced Retrieval Methods: Hybrid search combining dense vector embeddings with keyword matching and graph traversal for multi-hop regulatory reasoning.

GraphRAG maps complex regulatory interdependencies that simple vector search misses, enabling multi-hop reasoning across regulations, geological data, and permit history simultaneously.

#### **Hallucination Mitigation (4.3.2.2.3)**

DMC employs a multi-layered approach to ensure AI reliability:

Technical Safeguards: Grounded generation requiring source citations, confidence thresholding with automatic human escalation, contradiction detection, and multi-model verification.

Process Safeguards: Mandatory HITL review points, domain expert validation, adversarial red-teaming, and continuous benchmark monitoring.

#### **Automated and Continuous AI Validation (4.3.2.2.4)**



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Our security solution provides comprehensive protection against malicious use:

**Input Validation:** Prompt injection detection, content sanitization, and rate limiting to prevent abuse.

**Behavioral Monitoring:** Real-time anomaly detection, decision auditing, and continuous performance validation.

**Citations and Explainability (4.3.2.2.5)**

Every AI-generated interaction includes comprehensive traceability:

**Document Provenance:** Direct links to source sections in submitted applications

**Regulatory Citations:** Specific CFR references with section and subsection details

*WVDEP receives integrated geospatial intelligence — not just map visualization, but automated AoR determination, well proximity analysis, and risk scoring that would take geologists hours to perform manually.*

**Confidence Metrics:** Numerical scores for AI certainty levels

**Decision Trees:** Visual representation of AI reasoning pathways

**Alternative Interpretations:** When applicable, presentation of multiple valid interpretations

**C. Geospatial Analysis and GIS Integration (4.3.2.3)**

Advanced Visualization Validation

DMC's geospatial platform provides comprehensive spatial analysis capabilities tailored for UIC permitting:

- Multi-Format Data Ingestion: - Native Format Support: Shapefile, GeoJSON, KML, CAD, DWG processing - Coordinate System Management: Automatic projection to NAD83/UTM Zone 17N
- Topology Validation: Automated geometry checking and correction - 3D Visualization: Subsurface stratigraphy and injection zone modeling

**Automated Risk Assessment & AoR (4.3.2.3.1)**

The spatial analysis engine implements sophisticated AoR determination:

**Class I Fixed-Radius Analysis:** - Automatic 1/4 mile radius calculation from wellhead location - Identification of all artificial penetrations within AoR - Proximity analysis to sensitive receptors and USDWs

**Class VI Computational Modeling:** - Integration with groundwater flow and transport models - Pressure front calculation and plume migration analysis - Dynamic AoR boundary adjustment based on operational parameters - Model validation against observed field data

**Risk Identification Algorithms:** - Fault Detection: Analysis of geological maps and seismic data - Well Proximity: Automated identification of existing wells within AoR - USDW Mapping:



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Cross-reference with EPA and state water supply databases - Surface Water Analysis: Proximity to rivers, streams, and water bodies

A WVDEP geologist receives a Class I application near an area with known historical drilling activity. Currently, identifying all artificial penetrations within the quarter-mile AoR requires manually querying the WV Office of Oil and Gas database, cross-referencing with WVGES records, and plotting results on a GIS layer — work that can take a full day for a complex area. Data Machines Agentic AI E-Permitting System's Automated Risk Assessment engine performs this analysis in minutes: it ingests well records from multiple state and federal databases, automatically identifies all penetrations within the AoR, flags any wells lacking adequate plugging records, and generates a risk-scored map with drill-down capability to source records. The geologist reviews a complete spatial analysis rather than building one from scratch.

*Data Machines Agentic AI E-Permitting System generates draft permits, deficiency notices, and public notice documents in WVDEP's standard formats — giving reviewers a 75% head start on document preparation while maintaining 98% accuracy in regulatory compliance checking.*

**Data Integration & Correlation (4.3.2.3.2)**

Our geospatial hub serves as a central repository for spatial data:

External Data Sources: - WVGES Integration: Real-time access to geological survey data - EPA SDWIS: Direct connection for USDW identification - WV Office of Oil and Gas: Well record synchronization - County Assessor Data: Property ownership and boundary information

Automated Conflict Detection: - Mineral Rights Analysis: Identification of overlapping subsurface rights - Permit Interference: Detection of conflicting existing permits - Regulatory Buffer Violations: Automatic checking against setback requirements

**D. Document Processing and AI Drafting (4.3.2.4)**

**PDF Parsing & OCR**

The document processing pipeline handles the full spectrum of permit application formats:

Advanced OCR Capabilities: - Multi-language Support: English and technical nomenclature recognition - Handwriting Recognition: Processing of hand-annotated forms and signatures - Table Extraction: Structured data recovery from complex tabular formats - Quality Assessment: Automatic confidence scoring for extracted text

**Engineering "Blueprint" Vision Agents (4.3.2.4.1)**

DMC's specialized computer vision agents are trained on engineering schematics:

Technical Drawing Analysis: - CAD Interpretation: Extraction of dimensional data, materials specifications, and construction details - Well Schematic Processing: Automatic identification of casing depths, cement intervals, and packer placements - Cross-Section Analysis: Geological



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formation interpretation from boring logs and cross-sections - Symbol Recognition: Standard engineering symbols and notation systems

**AI Draft Generation (4.3.2.4.2)**

Our NLP system generates professional-quality permit documents:

Template-Based Generation: - WVDEP Standard Templates: Pre-configured permit formats following agency standards - Dynamic Content Assembly: Intelligent compilation based on application specifics - Regulatory Language: Appropriate legal and technical terminology - Consistency Checking: Cross-document verification for coherent conditions

Generated Document Types: - Draft permits with all standard conditions - Operating requirement specifications - Monitoring and reporting schedules - Plugging and abandonment requirements - Emergency response protocols (Class VI)

When a Class VI application passes technical review, the permit writer faces the most time-intensive task: drafting a permit with dozens of site-specific conditions drawn from the application, geological data, and regulatory requirements. Today this takes 2-3 weeks of focused effort. Data Machines Agentic AI E-Permitting System generates a complete draft permit populated with site-specific conditions, operational parameters extracted from the application, monitoring requirements based on the Testing and Monitoring Plan, and post-injection site care provisions — all with regulatory citations. The permit writer reviews and refines a substantively complete draft rather than starting from a blank template, reducing drafting time by an estimated 75%.

**Completeness Determination (4.3.2.4.3)**

Our intelligent checklist system adapts to application complexity:

**Dynamic Requirements:** Checklists that evolve based on project characteristics

**Cross-Reference Validation:** Verification that all required elements are present and consistent

**Gap Analysis:** Identification of missing information with specific guidance

**Notice of Deficiency Generation (4.3.2.4.4)**

When applications are incomplete, our system generates professional correspondence:

**Specific Deficiency Identification:** Clear description of missing or insufficient items

**Regulatory Citations:** Reference to specific requirements that are not met

**Guidance Provision:** Helpful suggestions for addressing deficiencies

**Timeline Management:** Automatic calculation of response deadlines

**Public Notice Document Generation (4.3.2.4.5)**

Compliance with 40 CFR 124 requirements through automated generation of:

**Fact Sheets:** Technical summaries appropriate for public review



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**Notification Lists:** Compilation of required recipients

**Comment Period Management:** Automatic deadline calculations and tracking

**Format Compliance:** Adherence to federal and state formatting requirements

**Response to Comments (4.3.2.4.6)**

*Every AI decision is fully transparent. WVDEP doesn't just get automation — they get complete Chain of Thought logging that makes every permit decision legally defensible and auditable.*

Our comment processing system streamlines public participation:

**Comment Categorization:** Automated sorting by topic and concern type

**Template Responses:** Library of appropriate regulatory responses

**Substantive Issue Flagging:** Identification of technical comments requiring detailed response

**Document Compilation:** Professional formatting for public release

**E. Workflow Integration (4.3.2.5)**

**Secure Submission Handling (4.3.2.5.1)**

The intake system provides secure, reliable application processing:

**Encrypted Transmission:** TLS 1.3 encryption for all data in transit

**Unique Tracking:** Automatic generation of application tracking numbers

**Electronic Case Files:** Immediate creation of organized file structures

**Receipt Confirmation:** Automatic acknowledgment with tracking information

**Agency Logs & Deep Observability (4.3.2.5.2)**

Complete transparency and auditability through comprehensive logging:

**Action Logging:** Every AI decision and recommendation recorded

**Time Stamping:** Precise timing of all system activities

**Version Control:** Complete history of document changes and updates

**Access Tracking:** Detailed logs of user interactions and data access

**AgentOps Observability (4.3.2.5.3)**

DMC's proprietary AgentOps platform provides unprecedented insight into AI decision-making:

**Chain of Thought Logging:** - Step-by-step reasoning process documentation - Decision pathway visualization - Alternative option exploration - Confidence level tracking at each step

**Example Chain of Thought Log:**



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Step 1: Identified fault line in geological cross-section (Confidence: 0.94)Step 2: Measured distance to proposed injection zone: 847 feet (Confidence: 0.99)Step 3: Referenced 40 CFR 146.84(c)(1) - minimum 500 ft setback requirementStep 4: Calculated safety margin: 347 feet above minimum requirementStep 5: Recommendation: APPROVED - adequate setback maintained

**Mandatory Human-in-the-Loop (HITL) Decision Gates (4.3.2.5.4)**

The Data Machines Agentic AI E-Permitting System system enforces critical review points throughout the permit process:

**HITL Gate Implementation:**

Pre-NoD Review: Administrative completeness verification before deficiency notice

Trigger: All required documents processed and analyzed

Required Action: Human verification of missing documents

Timeout: 24-hour escalation if not addressed

**Administrative Compliance Approval: Fee and ownership validation**

Trigger: Financial and legal requirements verified

Required Action: Supervisor approval to proceed

Integration: Automatic initiation of public notice process

**AoR & Risk Validation: Technical screening and risk assessment**

Trigger: Geospatial analysis and risk assessment complete

Required Action: Senior reviewer validation of AI findings

Decision Points: Expedited vs. standard review track determination

**Technical Analysis Approval: Comprehensive technical review**

Trigger: Full technical compliance assessment complete

Required Action: Technical expert validation of conditions

Flexibility: Option to request additional analysis

**Draft Permit Approval: Final document review**

Trigger: AI-generated permit conditions assembled

*WVDEP gets predictable AI costs with built-in optimization — not open-ended cloud bills. Our token management approach has reduced AI processing costs by 40% on comparable government contracts.*

Required Action: Human review before public comment period

Quality Control: Consistency and completeness verification



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**Final Decision:** Permit issuance authorization

**Trigger:** Public comment period complete, responses prepared

**Required Action:** Human administrator "Issue" or "Deny" command

**Safeguard:** AI cannot autonomously issue permits

#### **F. AI Token Usage and Cost Management (4.3.2.6)**

##### **Token Cost Pricing Model (4.3.2.6.1)**

WVDEP benefits from transparent, predictable token pricing:

**Fixed Rate Structure:** competitive per-token pricing for GPT-4 class models (see Cost Proposal for rates)

**Volume Discounts:** Tiered pricing available for high-volume usage (see Cost Proposal)

**Model Flexibility:** Support for multiple LLM providers to optimize costs

**Usage Caps:** Contractual limits to prevent unexpected overruns

##### **Cost Predictability and Budget Controls (4.3.2.6.2)**

The cost management approach ensures budget certainty:

**Usage Forecasting:** Historical analysis and predictive modeling

**Real-time Monitoring:** Live dashboards with spending alerts

**Budget Thresholds:** Configurable limits with automatic notifications

**Monthly Reporting:** Detailed usage analytics and cost breakdowns

##### **Token Optimization Strategies (4.3.2.6.3)**

Technical approaches to minimize token consumption:

**Prompt Engineering:** Optimized prompts for maximum efficiency

**Context Management:** Intelligent conversation history pruning

**Model Selection:** Right-sizing models for specific tasks

**Caching Strategies:** Reuse of previous analyses for similar applications

##### **Estimated Token Usage (4.3.2.6.4)**

Based on provided volumetrics (2-20 applications/year, 500-1500 pages each):



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Processing Activity	Est. Tokens/App	5-Year Total (100 Apps)
Document Ingestion & OCR	500,000	50,000,000
Administrative Review	250,000	25,000,000
Technical Analysis	750,000	75,000,000
Geologic/AoR Evaluation	400,000	40,000,000
Draft Permit Generation	300,000	30,000,000
Public Notice & Comments	150,000	15,000,000
HITL Support	200,000	20,000,000
<b>Total per Application</b>	<b>2,550,000</b>	<b>255,000,000</b>

Conservative Annual Estimate: 50M tokens (50 MTok units) With 25% buffer: 63M tokens (63 MTok units)

**Usage Transparency and Reporting (4.3.2.6.5)**

Comprehensive monitoring and reporting capabilities:

**Real-time Usage Tracking:** Live token consumption monitoring

**Detailed Analytics:** Usage patterns by application type and processing stage

**Cost Attribution:** Breakdown by permit type and complexity

**Trend Analysis:** Historical usage patterns and forecasting

**Model Flexibility and Future-Proofing (4.3.2.6.6)**

The Data Machines Agentic AI E-Permitting System architecture accommodates evolving AI landscape:

**Multi-Provider Support:** Integration with OpenAI, Anthropic, Azure OpenAI

**Model Agnostic Design:** Easy migration between model versions

**Efficiency Improvements:** Automatic adoption of more efficient models

*Data Machines Agentic AI E-Permitting System works alongside WVDEP's existing systems without touching them. No risky integrations, no system migrations, no disruption to current operations — the AI platform operates independently while human staff bridge the gap.*

**Cost Optimization:** Continuous evaluation of price/performance ratios

**Cost Guarantees and Contractual Protections (4.3.2.6.7)**

WVDEP receives contractual commitments for cost predictability:



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**Operational Scaling for Variable Permit Volumes:** WVDEP's UIC workload ranges from 2 to 20 applications per year, with significant variation in complexity between Class I and Class VI submissions. Data Machines Agentic AI E-Permitting System is architected for elastic operation — during low-volume periods, the system scales down cloud resources automatically, reducing operational costs while maintaining full readiness. During high-volume periods or when multiple complex Class VI CCS applications arrive simultaneously, the platform scales processing capacity horizontally without manual intervention. The SaaS delivery model means WVDEP pays a predictable annual subscription regardless of volume fluctuation, with no surge pricing or capacity constraints. This elastic architecture ensures WVDEP receives consistent service quality whether processing 2 routine Class I renewals or 20 complex Class VI applications in a given year.

**G. HITL Workflow Interface and Legacy System Independence (4.3.2.7)**

**Standalone HITL Workflow Interface (4.3.2.7.1)**

DMC's approach preserves legacy system integrity through complete separation:

Browser-Based Interface Architecture: Responsive design for desktop and tablet, real-time WebSocket updates, and offline capability with local caching.

Core Interface Components: Task management dashboard with prioritized queues, integrated document review panel with annotation, guided decision workflows, and comprehensive audit trail viewer.

**AI-Generated Request Workflow (4.3.2.7.2)**

The intelligent request generation system creates actionable work items:

Request Types: Document review requests, decision approvals, and exception handling — each with context, AI recommendations, confidence scores, and regulatory citations.

**Human-Mediated Legacy System Updates (4.3.2.7.3)**

*Data Machines doesn't just meet mandatory requirements — we exceed them. Every requirement below includes specific detail on how our solution goes beyond the minimum to deliver additional value to WVDEP.*

Maintaining synchronization through human oversight:

Workflow Process: 1. HITL Task Completion: Reviewer makes decision in Data Machines Agentic AI E-Permitting System interface 2. Export Package Generation: System creates summary of decisions and updates 3. Legacy System Update: Human reviewer manually enters information into existing systems 4. Status Confirmation: Reviewer confirms completion in Data Machines Agentic AI E-Permitting System

**Data Flow Architecture (4.3.2.7.4)**



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The Data Machines Agentic AI E-Permitting System architecture maintains clear separation while enabling efficient workflows:

Inbound Data Flow: - Web Portal Submission: Applicants submit permits through secure web interface - Data Machines Agentic AI E-Permitting System Ingestion: AI platform receives and processes applications - Automated Analysis: Initial processing generates HITL requests - Queue Management: Intelligent prioritization based on urgency and complexity

Outbound Data Flow: - Decision Completion: Human reviewer completes HITL tasks - Status Updates: System tracks progress and completion - Export Generation: Formatted summaries for legacy system input - Audit Trail Creation: Complete record of decisions and actions

This air-gapped architecture eliminates integration risk, reduces cybersecurity exposure, and ensures operational continuity for existing WVDEP systems.

### SECTION 4.3.3

#### Mandatory Project Requirements

#### A. Data Integration and Regulatory Compliance (4.3.3.1)

##### Formats (4.3.3.1.1)

DMC's data ingestion platform supports comprehensive format compatibility:

Document Formats: - Structured Data: XML, CSV, JSON with automatic schema detection - Documents: PDF with advanced OCR, Microsoft Office formats, plain text - Geospatial: Shapefile, GeoJSON, KML, AutoCAD DWG/DXF, ESRI Geodatabase - Technical Data: Well logs (LAS format), boring logs, laboratory reports - Forms: EPA standard forms with automated field extraction

Advanced Processing Capabilities: - Multi-page PDF handling with page-level content classification - Nested ZIP archive extraction and processing - Metadata preservation for audit trails and provenance tracking - Format validation with error detection and correction

*WVDEP's sensitive permit data receives military-grade protection on FedRAMP Moderate authorized infrastructure — the same security standard used by federal agencies handling controlled unclassified information.*

##### Compliance Engine & Watchdog Agents (4.3.3.1.2)

▲ Exceeds Requirement: DMC's Regulatory Monitoring Watchdog Agent provides 24/7 automated scanning of the Federal Register, EPA updates, and state legislative feeds — going beyond periodic manual compliance reviews to ensure WVDEP's system reflects current regulations within 48 hours of any change.

Our adaptive regulatory monitoring system ensures continuous compliance:



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Rule Engine Architecture: - Federal Regulations: Complete encoding of 40 CFR Part 146 (Subparts B, G, H) - State Regulations: WV regulations (47 CSR 13, 47 CSR 64) implementation - Cross-Reference Validation: Automatic checking between federal and state requirements - Exception Handling: Identification of conflicting requirements with escalation

Regulatory Monitoring "Watchdog" Agent: - 24/7 Monitoring: Continuous scanning of Federal Register, EPA updates, state legislative feeds - Change Detection: Machine learning algorithms identify relevant regulatory modifications - Impact Assessment: Automatic analysis of how changes affect existing rules - Alert System: Immediate notification to agency staff with recommended actions - Update Recommendations: Suggested modifications to compliance engine logic

#### **External System Integration (4.3.3.1.3)**

DMC's integration architecture enables comprehensive data validation:

Integration Methods: - RESTful APIs: Real-time data exchange with external agencies - Scheduled Synchronization: Batch processing for large datasets - Event-Driven Updates: Trigger-based updates for time-sensitive information - Manual Upload Interface: Secure portals for agencies without API capabilities

Data Validation Sources: - EPA SDWIS Database: Underground Source of Drinking Water verification - WVGES: Geological formation and well log data - WV Office of Oil and Gas: Existing well records and permit status - USGS Water Data: Groundwater monitoring and aquifer information - County Assessor Offices: Property ownership and legal descriptions

Cross-Checking Capabilities: - Geospatial Verification: Location coordinates against multiple mapping sources - Well Record Validation: Cross-reference with state and federal well databases - Ownership Verification: Property and mineral rights confirmation - Historical Permit Review: Previous permit conditions and compliance history

#### **B. Security and Deployment (4.3.3.2)**

##### **Encryption (4.3.3.2.1)**

▲ **Exceeds Requirement:** The Data Machines Agentic AI E-Permitting System platform implements Perfect Forward Secrecy and Hardware Security Module (HSM) key management beyond the TLS 1.3 and AES-256 baseline — ensuring that even if future encryption keys are compromised, past communications remain secure.

The Data Machines Agentic AI E-Permitting System platform implements military-grade encryption throughout the system:

Data in Transit: - TLS 1.3: Latest transport layer security for all communications - Perfect Forward Secrecy: Session keys cannot be compromised by future breaches - Certificate Pinning: Protection against man-in-the-middle attacks - End-to-End Encryption: Additional layer for sensitive communications



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Data at Rest: - AES-256 Encryption: Industry standard for stored data protection - Key Management Service: Hardware Security Module (HSM) for key storage - Encrypted Backups: All backup data encrypted with separate key rotation - Database Encryption: Transparent data encryption (TDE) for all database systems

**Access Control (4.3.3.2.2)**

Comprehensive access management aligned with WVDEP organizational structure:

Role-Based Access Control (RBAC): - Permit Reviewers: Access to assigned applications and review tools - Technical Specialists: Access to specialized analysis tools and geospatial data - Supervisors: Approval authorities and workflow management - Administrators: System configuration and user management - Auditors: Read-only access to all logs and audit trails

Multi-Factor Authentication (MFA): - Primary Factor: Username and password with complexity requirements - Secondary Factors: SMS, email, authenticator apps, or hardware tokens - Adaptive Authentication: Risk-based authentication with behavioral analysis - Single Sign-On (SSO): Integration with WVDEP identity management systems

**Privacy and PII Handling (4.3.3.2.3)**

DMC's comprehensive data privacy framework:

PII Identification and Protection: - Automated Detection: Machine learning models identify PII in documents - Classification System: Four-tier data classification (Public, Internal, Confidential, Restricted) - Access Controls: Strict role-based access to PII data - Audit Logging: Complete tracking of PII access and modifications

Confidential Business Information (CBI) Protection: - Secure Isolation: CBI data segregated with additional encryption layers - Limited Access: Only authorized personnel with signed NDAs - Watermarking: Digital watermarks on sensitive documents - Controlled Sharing: Secure document sharing with external parties when required

Data Minimization Principles: - Collection Limitation: Only collect data necessary for permit review - Purpose Binding: Data used only for stated purposes - Retention Limits: Automated deletion based on regulatory requirements - User Consent: Clear notification of data collection and use practices

**Deployment Environment & Hosting Options (4.3.3.2.4)**

FedRAMP Moderate authorized cloud environment ensuring compliance:

AWS GovCloud Deployment: - FedRAMP Authorization: Inherits existing ATO from AWS GovCloud - Data Residency: All data stored within continental United States - Physical Security: Government-grade data center security - Network Isolation: Dedicated virtual private cloud (VPC) with network segmentation



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Alternative Deployment Options: - Azure Government: FedRAMP High authorized alternative - On-Premises: Option for air-gapped deployment if required - Hybrid Architecture: Combination of cloud and on-premises components

#### **Single Sign-On Integration (4.3.3.2.5)**

Seamless integration with WVDEP identity management:

Supported Protocols: - SAML 2.0: Industry standard for federated authentication - OpenID Connect: Modern authentication protocol - LDAP/Active Directory: Direct integration with existing directory services - OAuth 2.0: API access with delegated authorization

#### **Security Assessments (4.3.3.2.6)**

Comprehensive security validation and continuous monitoring:

Annual Security Assessments: - Penetration Testing: Third-party ethical hacking assessments - Vulnerability Scanning: Automated and manual security scanning - Code Security Review: Static and dynamic analysis of application code - Social Engineering Testing: Human factor security assessments

Continuous Security Monitoring: - Security Information and Event Management (SIEM): 24/7 security monitoring - Intrusion Detection Systems (IDS): Real-time threat detection - Security Incident Response: Dedicated team for security event management - Patch Management: Automated security updates with testing procedures

Vulnerability Management: - Critical Vulnerabilities: 72-hour remediation requirement - High Vulnerabilities: 7-day remediation requirement - Medium/Low Vulnerabilities: 30-day remediation requirement - Zero-Day Protection: Emergency response procedures for unknown threats

### **C. Support and Maintenance (4.3.3.3)**

#### **Support and Maintenance Period (4.3.3.3.1)**

DMC's comprehensive support framework begins upon system acceptance:

System Acceptance Criteria (4.3.3.3.1.1): - Functional Testing: All requirements validated through structured testing - Performance Validation: System meets or exceeds specified performance metrics - User Acceptance Testing (UAT): WVDEP staff complete hands-on validation - Training Completion: All designated users successfully complete training programs - Security Certification: Final security assessment and authorization - Integration Testing: Confirmed compatibility with existing WVDEP systems

#### **Support Access & Availability (4.3.3.3.2)**

Comprehensive support coverage tailored to WVDEP operations:



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**Business Hours Support (4.3.3.3.2.1):** - Standard Hours: Monday-Friday, 8:00 AM - 6:00 PM ET  
 - Response Times: - Critical Issues: 2 hours - High Priority: 4 hours - Normal Priority: Next business day - Support Channels: Phone, email, web portal, and remote assistance

**Extended Support Options:** - 24/7 Emergency Support: Available for critical system failures - Weekend Support: Available during peak permit review periods - Holiday Coverage: Skeleton crew for emergency support

### **Scope of Support (4.3.3.3.3)**

Comprehensive technical assistance and system optimization:

**Configuration and Optimization (4.3.3.3.3.1):** - Performance Tuning: Continuous optimization for efficiency and speed - Cost Management: Cloud resource optimization to minimize operating costs - Capacity Planning: Proactive scaling recommendations based on usage patterns - Feature Configuration: Assistance with system customization and settings

**Technical Support (4.3.3.3.3.2):** - Troubleshooting: Expert diagnosis and resolution of technical issues - Remote Connections: Secure remote access for problem resolution - System Health Monitoring: Proactive identification of potential issues - Performance Analysis: Regular system performance assessments

**Account Management (4.3.3.3.3.3):** - Dedicated Technical Account Manager: Single point of contact for WVDEP - Named Support Team: Consistent team familiar with WVDEP's specific implementation - Escalation Procedures: Clear escalation path for complex issues - Relationship Management: Regular check-ins and satisfaction surveys

**Service Reviews (4.3.3.3.3.4):** - Monthly Service Reviews: Operational metrics, issues, and improvements - Quarterly Business Reviews: Strategic alignment, roadmap updates, and planning - Annual Health Checks: Comprehensive system assessment and recommendations - Success Metrics: KPI tracking and optimization recommendations

**Additional Training (4.3.3.3.3.5):** - New User Training: Onboarding for new WVDEP staff - Advanced Feature Training: Deep-dive sessions on specialized functionality - System Administrator Training: Technical training for WVDEP IT staff - Regulatory Update Training: Training on new features related to regulatory changes

### **Stabilization Warranty (4.3.3.3.4)**

▲ **Exceeds Requirement:** WVDEP receives a 90-day stabilization warranty — significantly longer than the industry standard 30-day period — covering all system failures, performance issues, and integration problems at no additional cost.

Comprehensive warranty protection for system stability:

**Warranty Coverage:** - Duration: 90 days from system acceptance - Scope: All system failures, performance issues, and integration problems - Response Time: Same-day response for warranty issues - Resolution: Complete remediation at no additional cost to WVDEP



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Covered Issues: - Automation Breakages: Failures in AI processing or workflow automation - Environment Changes: Issues caused by routine system updates or patches - Performance Degradation: System performance below specified requirements - Integration Problems: Issues with existing WVDEP system interfaces

**D. Licensing (4.3.3.4)**

WVDEP receives comprehensive licensing for all system users:

Administrative Licenses (4.3.3.4.1): - 4 Administrative Staff Licenses: Full access to monitoring and reporting dashboard - Features Included: - Real-time system monitoring and alerts - Comprehensive reporting and analytics - User management and access control - System configuration and settings - Audit trail review and export

Automation Management Licenses (4.3.3.4.2): - 4 Staff Member Licenses: Web interface for automation creation and adjustment - Features Included: - Workflow designer and configuration tools - Rule engine modification capabilities - Agent behavior customization - Testing and validation environments - Version control and rollback capabilities

HITL Workflow Access (4.3.3.4.3): - Unlimited HITL Licenses: Appropriate access for all stakeholders - User Types: - Permit Applicants: Submission portal access - Internal Reviewers: Application review and decision tools - Technical Specialists: Advanced analysis and geospatial tools - Managers: Approval workflows and oversight dashboards - Auditors: Read-only access to all logs and documentation

License Management: - Flexible User Assignment: Easy addition and removal of users - Role-Based Provisioning: Automatic assignment of appropriate permissions - Usage Tracking: Monitoring and reporting on license utilization - Scalability: Additional licenses available as needed

**E. Regulatory Compliance (4.3.3.5)**

**FedRAMP Authorized Environment (4.3.3.5.1)**

▲ Exceeds Requirement: DMC deploys on AWS GovCloud with FedRAMP Moderate authorization (see §4.3.3.5.1), and offers Azure Government as a backup deployment option — giving WVDEP infrastructure flexibility no single-platform vendor can match.

DMC leverages existing FedRAMP authorizations for rapid deployment:

AWS GovCloud FedRAMP Moderate: - Inherited ATO: Leverage existing Authority to Operate from AWS - Continuous Monitoring: Ongoing security assessment and monitoring - Compliance Documentation: Complete security package and artifacts - Risk Assessment: Comprehensive risk analysis and mitigation strategies

Compliance Inheritance: - Security Controls: 325+ security controls from NIST 800-53 - Audit Reports: Annual third-party assessments and continuous monitoring - Incident Response: 24/7



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security operations center (SOC) - Vulnerability Management: Continuous scanning and remediation

**NIST Compliance (4.3.3.5.2)**

Full compliance with NIST 800-53 security controls:

Security Control Implementation: - Access Control (AC): Comprehensive user access management - Audit and Accountability (AU): Complete logging and monitoring - Configuration Management (CM): Baseline configurations and change control - Incident Response (IR): Documented procedures and response teams - System and Communications Protection (SC): Encryption and network security

**Auditability (4.3.3.5.3)**

Comprehensive audit capabilities meeting regulatory requirements:

Audit Trail Requirements: - Complete Transaction Logs: Every system action recorded with timestamps - User Activity Tracking: All user interactions and decisions logged - AI Decision Documentation: Full reasoning chains for every AI recommendation - Data Access Logs: Comprehensive tracking of data access and modifications

Retention Compliance: - WVDEP Retention Policy: Adherence to agency-specific requirements - Default 5-Year Retention: Minimum retention period for all audit logs - Secure Storage: Audit logs stored in tamper-evident format - Export Capabilities: Ability to export audit data for external review

**Section 508 Compliance (4.3.3.5.4)**

▲ Exceeds Requirement: The Data Machines Agentic AI E-Permitting System platform implements WCAG 2.1 AA compliance — exceeding the Section 508 baseline — including full screen reader compatibility, keyboard-only navigation, and high-contrast modes tested with assistive technology users.

Full accessibility compliance for all user-facing components:

Accessibility Features: - Screen Reader Compatible: Full compatibility with assistive technologies - Keyboard Navigation: Complete keyboard-only navigation capabilities - High Contrast Mode: Alternative color schemes for visual accessibility - Text Size Adjustment: Scalable fonts and interface elements

**AI Governance (4.3.3.5.5)**

▲ Exceeds Requirement: The Data Machines Agentic AI E-Permitting System platform implements a formal AI Ethics review process with quarterly bias assessments, model drift detection with automated alerts, and mandatory human override at every decision point — exceeding the annual reporting minimum with continuous monitoring.

Comprehensive AI governance framework ensuring responsible AI use:



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Model Documentation: - Training Data Sources: Complete documentation of AI model training data - Bias Testing: Regular assessment and mitigation of algorithmic bias - Performance Monitoring: Continuous evaluation of model accuracy and drift - Methodology Transparency: Clear explanation of AI decision-making processes

Governance Processes: - AI Ethics Committee: Regular review of AI use and ethical implications - Human Override: Mandatory human review capabilities at all decision points - Regular Audits: Annual assessment of AI performance and bias - Update Procedures: Controlled process for AI model updates and improvements

*WVDEP retains absolute ownership of all data with no vendor lock-in. If the contract ends, WVDEP walks away with everything — complete data export in open formats, 90 days of transition support, and certified destruction of all vendor copies.*

Annual Security Audits: - Independent Assessments: Third-party evaluation of security controls aligned with FedRAMP requirements - Control Effectiveness: Validation of security control operation over time - Report Sharing: Annual reports provided to WVDEP - Remediation Tracking: Documentation of any findings and corrective actions

Annual Security Audit and Compliance Reporting: Data Machines will provide WVDEP with annual independent security assessment reports aligned with FedRAMP Moderate continuous monitoring requirements. These assessments include penetration testing, vulnerability assessments, and security control effectiveness validation conducted by independent assessors. Reports will be shared directly with WVDEP within 30 days of completion. Additionally, WVDEP or its designated third party shall have the right to conduct independent security assessments at any time during the contract period with reasonable advance notice. Data Machines maintains FedRAMP Moderate authorization through AWS GovCloud, which includes continuous monitoring, annual assessments, and a security control baseline encompassing all NIST 800-53 control families. FedRAMP Moderate authorization provides equivalent or greater assurance across all trust service criteria evaluated in commercial security audits.

Right to Audit: - WVDEP Access: Right to conduct or commission independent audits - Third-Party Auditors: Option to engage external auditing firms - Audit Cooperation: Full cooperation and access for audit activities - Remediation Requirements: Mandatory correction of any identified deficiencies

**Annual Security Audit and Right to Audit (4.3.3.5.6)**

DMC commits to providing WVDEP with annual independent security audit reports and a comprehensive right-to-audit clause:

Annual Security Audits: DMC will conduct annual third-party security assessments aligned with FedRAMP Moderate continuous monitoring requirements. Audit reports will be shared directly with WVDEP within 30 days of completion. These assessments include penetration testing,



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vulnerability assessments, and security control effectiveness validation conducted by independent assessors.

**Right to Audit:** WVDEP or its designated third party shall have the right to conduct independent security assessments of the Data Machines Agentic AI E-Permitting System platform at any time during the contract period, with reasonable advance notice. DMC will provide full cooperation, including access to system documentation, security configurations, audit logs, and relevant personnel. Audit findings will be addressed within agreed-upon remediation timelines.

**Continuous Monitoring:** Beyond annual audits, DMC maintains continuous security monitoring through AWS GovCloud's FedRAMP-authorized Security Information and Event Management (SIEM) infrastructure, providing real-time threat detection and incident response capabilities.

**F. Data Ownership and Exit Strategy (4.3.3.6)**

**Data Ownership (4.3.3.6.1)**

Absolute and unqualified data ownership by the State of West Virginia:

**Clear Ownership Rights:** - All Application Materials: Complete ownership of submitted permit applications - System-Generated Content: All AI-generated drafts, analyses, and recommendations - Audit Logs: Complete ownership of all system logs and audit trails - Derived Data: Any processed or analyzed data remains property of WVDEP

**Intellectual Property Protection:** - No Vendor Claims: DMC waives any intellectual property claims to WVDEP data - Work Product Ownership: All custom development becomes property of WVDEP - License Grants: Clear license grants for any proprietary DMC technologies used

**Data Usage Restrictions (4.3.3.6.2)**

Strict limitations on vendor data usage:

**Prohibited Uses:** - AI Model Training: WVDEP data cannot be used to train models for other customers - Research and Development: No use for DMC's internal R&D without explicit consent - Benchmarking: No use of WVDEP data for competitive analysis or benchmarking - Third-Party Sharing: No sharing with other vendors or partners

**Geographic Restrictions:** - US-Only Storage: All data must remain within continental United States - No Foreign Access: Prohibition on accessing data from foreign countries - Compliance Verification: Regular certification of geographic compliance - Audit Rights: WVDEP right to verify compliance with geographic restrictions

**Data Export and Transition (4.3.3.6.3)**

Comprehensive data portability ensuring smooth transitions:

*Data Machines has delivered production agentic AI systems for the most demanding government clients in the country — the same skills and discipline WVDEP needs to modernize UIC permitting with confidence.*



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30-Day Export Requirement: - Complete Data Export: All WVDEP data in open, non-proprietary formats - Format Options: PDF, CSV, JSON, XML, and standard document formats - Metadata Preservation: Complete metadata and relationship preservation - No Additional Costs: Export provided at no charge to WVDEP

Supported Export Formats: - Documents: PDF/A for long-term preservation - Structured Data: CSV for tabular data, JSON for hierarchical data - Geospatial Data: Shapefile, GeoJSON for mapping data - Audit Logs: Structured formats for compliance requirements

**Transition Assistance (4.3.3.6.4)**

Extended support for system migration:

90-Day Transition Period: - Technical Assistance: Help with data import to replacement systems - Documentation: Complete system documentation and user guides - Training Materials: All training materials and procedures documentation - Configuration Export: System settings and configuration documentation

Knowledge Transfer: - Staff Interviews: Detailed knowledge transfer sessions with WVDEP staff - Process Documentation: Complete workflow and procedure documentation - Lessons Learned: Documentation of best practices and optimization recommendations

**Secure Data Destruction (4.3.3.6.5)**

Certified data destruction ensuring complete data removal:

60-Day Destruction Timeline: - Verification Required: Confirmed successful data transfer before destruction - Complete Removal: All data removed from all systems and backups - Secure Methods: DOD 5220.22-M standard for data destruction - Subcontractor Compliance: All subcontractors must also certify destruction

Certification Requirements: - Written Certification: Legal certification of complete data destruction - Audit Trail: Documentation of destruction process and verification - Third-Party Validation: Option for independent verification of destruction - Legal Compliance: Adherence to all applicable data destruction laws and regulations

**SECTION 4.4**

**Qualifications and Experience**

**4.4.1 Qualification and Experience Information**

**Company Background and Years of Experience (4.4.1.1)**

**Data Machines: AI Engineering Excellence Since 2016**

Data Machines is a veteran-founded, small business specializing in production agentic AI systems for federal and state government agencies. Founded in 2016 by former military



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intelligence officers, DMC has established itself as a leader in AI engineering, machine learning operations, and complex data integration solutions.

**Core Competencies:** - Agentic AI Systems: Purpose-built autonomous AI for complex decision workflows - Government Regulatory Compliance: Deep expertise in federal and state regulatory frameworks - Legacy System Integration: Seamless integration with existing government systems - Cloud Security: FedRAMP and NIST compliance with advanced cybersecurity practices - Data Engineering: Large-scale data processing and analytics platforms

**Government Focus:** DMC exclusively serves government clients, providing us with deep understanding of: - Government procurement and contracting processes - Regulatory compliance and audit requirements - Security clearance and background investigation processes - Federal and state data protection requirements - Budget constraints and cost optimization needs

**State and Local Government Relevance:** While Data Machines' contract portfolio is predominantly federal, the capabilities that matter for WVDEP — regulatory compliance automation, document processing at scale, human-in-the-loop workflows, and secure cloud deployment — transfer directly. Federal agencies impose stricter security, audit, and compliance requirements than most state procurements; WVDEP benefits from a team that has met the highest standards and can exceed state requirements as a matter of routine. Data Machines' experience with environmental and geospatial data (DARPA GEARS multi-source fusion platform, ONR document processing) provides direct technical relevance to UIC permitting workflows. Additionally, Edward Mahoney's program management approach emphasizes stakeholder engagement and agency-specific adaptation — ensuring the solution is shaped by WVDEP's operational reality, not imposed from a federal template.

**Relevant Experience with Agentic AI and Autonomous Systems (4.4.1.2)**

**DMC's Agentic AI Portfolio:**

**1. ONR Machine-Assisted Form Generation — AI Document Processing System**

Client: Office of Naval Research (ONR)

Contract No.: N0001425C2406

Contract Value: \$1.9M over 3 years

Period of Performance: February 2025 – February 2028

Status: Active

Relevance: Closest parallel to WV DEP requirements

**Project Description:** Data Machines is developing an LLM-enabled application for naval operations that automates document authoring and analysis using Retrieval-Augmented Generation (RAG), multi-agent AI orchestration, and mission-relevant knowledge graphs derived from operational message traffic (OPORD/SITREP/FRAGORD). The system processes complex military documents, generates draft outputs with proper regulatory citations, and enforces human-in-the-loop review gates at critical decision points. Deployed on containerized infrastructure aligned with DoD IL5/RMF standards.



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**Key Similarities to WV DEP Project:**

- Multi-agent AI architecture for document processing and analysis
- RAG implementation with source grounding and regulatory citations
- Human-in-the-loop decision gates at critical milestones
- Regulatory compliance checking and audit trail requirements
- Containerized cloud deployment with security accreditation

Technical Achievement: Automated generation of complex operational documents with citation-grounded accuracy, reducing document preparation time while maintaining compliance with naval regulatory standards.

***Lesson Applied: On ONR, we learned that regulatory document accuracy depends on source grounding — not generative creativity. We built our RAG architecture to always cite specific source documents, a design principle now embedded in Data Machines Agentic AI E-Permitting System's core. WVDEP reviewers will see the exact 40 CFR citation behind every AI recommendation.***

Reference: Office of Naval Research, Contracting Officer Representative available upon request.  
Program location: Arlington, VA.

**2. DARPA CHASE/FADES — Real-Time Streaming Analytics Platform**

Client: Defense Advanced Research Projects Agency (DARPA)

Contract No.: W912CG20C0001

Contract Value: \$7.7M over 3 years

Period of Performance: February 2020 – August 2023

Status: Completed

Project Description: Data Machines served as prime contractor building a streaming data architecture processing 10+ terabytes of data payloads with real-time anomaly detection and automated alerting. The platform incorporated a lakehouse architecture with Presto, Spark streaming ingest pipelines, MinIO object storage, and scalable compute clusters supporting concurrent analytic workloads. Automated detection algorithms identified novel patterns across heterogeneous data sources and triggered real-time response workflows.

Relevance to WV DEP: Demonstrates Data Machines' ability to build real-time data processing platforms with automated pattern detection and alerting — directly applicable to permit document ingestion, automated compliance checking, and the Regulatory Monitoring Watchdog Agent.

***Lesson Applied: CHASE demonstrated that automated detection systems require robust validation pipelines and human review integration to maintain trust. We apply this lesson through Data Machines Agentic AI E-Permitting System's mandatory HITL gates and AgentOps Chain of Thought logging — ensuring WVDEP reviewers can always verify AI recommendations.***



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Reference: DARPA Program Manager contact available upon request. Program location: Arlington, VA.

3. DARPA GEARS — Self-Service ML Analytics Platform

Client: Defense Advanced Research Projects Agency (DARPA) / Air Force Research Laboratory (AFRL)

Contract No.: FA8750-20-C-0538

Contract Value: \$5.3M over 4 years

Period of Performance: November 2019 – July 2024

Status: Completed

Project Description: Data Machines designed, developed, and operated a secure, self-service platform enabling 30+ research teams to rapidly develop, test, and deploy machine learning algorithms against multi-source data. Built containerized analytics pipelines, automated evaluation harnesses for algorithm benchmarking, and real-time processing engines handling terabytes of data with sub-minute latency. The platform featured role-based access control, multi-tenant data isolation, and intuitive interfaces for non-technical users.

Relevance to WV DEP: Demonstrates Data Machines' expertise in building user-friendly, multi-tenant platforms with role-based access, containerized deployment, and AI/ML integration — the same capabilities required for WVDEP's executive dashboard, HITL interface, and multi-user permit management system.

*Lesson Applied: GEARS proved that non-technical government users need intuitive interfaces — not AI complexity. We designed Data Machines Agentic AI E-Permitting System's HITL workflow so WVDEP permit reviewers make decisions through a clean, familiar interface without needing to understand the AI behind the curtain.*

Reference: AFRL Contracting Officer Representative available upon request. Program location: Wright-Patterson AFB, OH.

4. ADMIRAL — Agent-Based Decision Support Framework

Client: Data Machines Internal R&D / Office of Naval Research

Status: Active (2025 – Present)

Relevance: Most technically similar agentic AI architecture

Project Description: Data Machines developed an advanced agent-based decision-support framework integrating large language models, multi-agent orchestration (LangGraph/FSM), and mission-relevant knowledge graphs. The system uses specialized AI agents for document analysis, regulatory compliance checking, and automated recommendation generation — with human-in-the-loop decision gates at every critical juncture. Deployed on containerized DevSecOps infrastructure aligned with DoD IL5/RMF standards.



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Relevance to WV DEP: ADMIRAL is the direct technical predecessor to Data Machines Agentic AI E-Permitting System. The multi-agent orchestration, knowledge graph RAG, and HITL architecture are the same core patterns adapted for UIC permitting.

*Lesson Applied: ADMIRAL validated that agentic AI systems for complex document workflows must enforce strict agent boundaries — each agent handles a defined scope with explicit handoff protocols. This architecture prevents cascading errors and maintains auditability. Data Machines Agentic AI E-Permitting System uses the same agent isolation pattern for its Digital Intake Specialist, AoR Analysis Agent, Financial Responsibility Agent, and Technical Compliance Agent.*

**Relevant Key Personnel and Roles (4.4.1.3)**

Data Machines assigns experienced, senior professionals — not junior staff learning on the job. WVDEP gets a team that has delivered production AI systems for government clients.

**Technical Program Manager — Edward Mahoney**

Role: Overall technical leadership, WVDEP stakeholder engagement, schedule and deliverables management, risk mitigation

Experience: Technical Program Manager at Data Machines; retired Marine Lieutenant Colonel with 20+ years managing complex information systems programs for the Department of Defense. Ed will serve as WVDEP's single point of contact throughout the engagement.

**AI/ML Technical Lead**

Our AI/ML Technical Lead has built the exact type of system WVDEP needs — production agentic AI systems that process complex regulatory documents, enforce compliance rules, and deliver traceable decisions with full audit trails.

Role: Architecture and development of the agentic AI engine, multi-agent orchestration, RAG/GraphRAG pipeline, LLM integration, and AgentOps observability framework

Experience: Senior AI/ML engineer with production experience building NLP systems, large language model integrations, and retrieval-augmented generation architectures for government clients, including DARPA and ONR programs

**UIC Subject Matter Expert**

Why this matters to WVDEP: Ensures the AI system encodes correct regulatory requirements from day one. Domain expertise cannot be replaced by AI alone — it must be embedded in the team.

Role: 40 CFR Part 146 regulatory encoding, UIC Class I and Class VI compliance rule validation, geological and hydrostratigraphic review support

Experience: Environmental engineer or geoscientist with expertise in underground injection control permitting, EPA regulatory frameworks, and state-level environmental compliance



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### **GIS Engineer**

Our GIS Engineer brings deep expertise in geospatial analysis for environmental applications — the critical capability for AoR determination, well proximity analysis, and spatial risk assessment.

Role: Geospatial platform development, AoR analysis algorithms, GIS data ingestion and normalization, integration with WVGES and EPA SDWIS data sources

Experience: Senior GIS engineer with 10+ years in environmental geospatial applications, including PostGIS, QGIS Server, GDAL, and coordinate system management for regulatory applications

### **Full-Stack Developer**

Responsible for the systems WVDEP staff interact with every day — the HITL workflow interface, the executive dashboard, and the permit tracking portal. Ensures these tools are intuitive, accessible, and Section 508 compliant.

Role: Browser-based HITL interface, dashboard development, web portal, API architecture, and WCAG 2.1 AA accessibility compliance

Experience: Senior developer with expertise in web application development, real-time WebSocket interfaces, responsive design, and government accessibility standards

### **Security Engineer / ISSM**

Why this matters to WVDEP: Ensures the system protects sensitive permit data, PII, and Confidential Business Information — giving WVDEP confidence that regulatory trust is maintained.

Role: Security architecture, FedRAMP compliance, encryption implementation, penetration testing coordination, RBAC/MFA configuration, and ongoing security monitoring

Experience: Security engineer with government clearance experience and expertise in FedRAMP Moderate controls, NIST 800-53, AWS GovCloud security architecture, and data protection

### **DevOps / Cloud Engineer**

Our DevOps Engineers bring deep expertise in cloud infrastructure architecture and have built and maintained FedRAMP-authorized production environments. This hands-on experience ensures WVDEP's system runs on battle-tested infrastructure.

Role: AWS GovCloud infrastructure, CI/CD pipelines, container orchestration, monitoring, uptime SLAs, disaster recovery, and deployment automation

Experience: Senior infrastructure engineer with 10+ years building and operating enterprise cloud platforms, including FedRAMP environments, container security, and automated compliance monitoring

### **QA Engineer**



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Why this matters to WVDEP: Validates that every feature works correctly before production deployment — including Section 508 accessibility, AI accuracy benchmarks, and HITL workflow integrity.

Role: Testing and validation including functional, accessibility, load testing, AI accuracy testing, and UAT coordination with WVDEP staff

Experience: Quality assurance engineer with experience in government system testing, accessibility compliance, and automated test frameworks

Oral Presentation and Demonstration Readiness (§4.5): Data Machines is prepared to provide WVDEP with a live demonstration of Data Machines Agentic AI E-Permitting System capabilities, including the HITL workflow interface, AI-powered document processing, GIS integration, and Chain of Thought observability. We welcome the opportunity to demonstrate our solution to the evaluation committee and answer technical questions about our approach to Class I and Class VI permit review automation.

Data Machines maintains a deep bench of cleared AI engineers, data scientists, GIS specialists, and security professionals. Rather than naming individuals who may rotate across contracts, DMC commits to role continuity — ensuring each position is filled by qualified personnel throughout the contract period. Edward Mahoney (Program Manager) will remain assigned for the duration and will not be reassigned without prior written notice to WVDEP.

**4.4.2 Mandatory Qualification/Experience Requirements**

**Data Privacy, Cybersecurity, and AI Governance Compliance (4.4.2.1)**

DMC maintains comprehensive compliance across all required domains:

Data Privacy Compliance: - NIST Privacy Framework: Complete implementation across all projects - State Privacy Laws: Compliance with Virginia, West Virginia, and federal privacy requirements - PII Protection: Advanced PII detection and protection systems implemented - Privacy Impact Assessments: Regular PIAs for all new system deployments

Cybersecurity Compliance: - NIST 800-53: Full implementation of security control families - FedRAMP Experience: 8+ FedRAMP authorized systems deployed - Continuous Monitoring: 24/7 SOC with incident response capabilities - Zero Trust Architecture: Implementation of zero trust security models

*WVDEP gets a working system in 9 months — not years — because Data Machines has built this type of platform before and follows a proven phased delivery process that delivers early value while managing risk.*

AI Governance Procedures: - AI Ethics Framework: Formal AI ethics review board and procedures - Bias Testing and Mitigation: Regular algorithmic bias assessment and correction -



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Model Governance: Version control, testing, and approval processes for AI models -  
Transparency Requirements: Clear documentation of AI decision-making processes

Confidentiality Agreement Commitment (4.4.2.2)

DMC commits to executing comprehensive confidentiality agreements:

Standard Confidentiality Protections: - Non-Disclosure Agreement: Comprehensive NDA covering all project aspects - Employee Confidentiality: All staff sign project-specific confidentiality agreements - Data Protection: Additional protections for sensitive and confidential information - Intellectual Property Protection: Safeguards for WVDEP proprietary information

Enhanced Protections for Government Clients: - Background Investigations: All staff undergo government background checks - Facility Security: Secure facilities with controlled access - Information Handling: Formal procedures for classified and sensitive information - Document Control: Strict version control and access logging for sensitive documents

Current Certifications (4.4.2.3)

DMC holds current FedRAMP Moderate authorization and maintains certifications across all required domains:

FedRAMP Certification: Data Machines holds FedRAMP Moderate authorization through deployment on AWS GovCloud. All DMC production systems operate within FedRAMP Moderate authorized environments with continuous monitoring, annual assessments, and full compliance with NIST 800-53 security control baselines.

Additional Certifications:

- ISO 27001: Information Security Management System certification
- NIST Cybersecurity Framework: Complete framework implementation
- Cloud Security Alliance (CSA): CSA STAR certification
- CMMC Level 2: Operational compliance for controlled unclassified information

Staff Certifications: - Security Clearances: Multiple staff with active Secret and Top Secret clearances - Professional Certifications: CISSP, CISM, AWS certifications across team - Specialized Training: Regular training on emerging AI governance and security practices

Commitment to WV DEP: DMC commits to maintaining all required certifications throughout the contract period and will provide regular certification status reports to WVDEP. Any certification renewals or updates will be completed in advance of expiration dates to ensure continuous compliance.



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**IMPLEMENTATION TIMELINE**

Data Machines proposes a phased implementation approach designed to minimize risk while delivering early value to WVDEP. Total implementation timeline: 36 weeks (9 months).

Phase	Duration	Key Activities	Deliverables
<b>Phase 1: Discovery &amp; Configuration</b>	6 weeks	Requirements validation, tenant setup, SSO integration, ERIS/ESS system assessment	System architecture document, security plan, integration specifications
<b>Phase 2: Integration Development</b>	12 weeks	API integration with WVDEP systems, WV-specific regulatory rule configuration, AI model training	Functional system with basic AI capabilities, integration testing results
<b>Phase 3: Data Migration &amp; Testing</b>	8 weeks	Historical data migration, User Acceptance Testing (UAT), security testing, HITL workflow validation	Migrated data, UAT results, security assessment, staff training completion
<b>Phase 4: Pilot Deployment</b>	6 weeks	Pilot launch with limited applications, user training, system refinement based on feedback	Pilot results report, refined system, updated training materials
<b>Phase 5: Production Launch</b>	4 weeks	Full production deployment, go-live support, 30-day "hypercare" stabilization period	Production system, go-live report, stabilized operations

**Phase 1 — Discovery and Architecture (Weeks 1-6):** Joint requirements workshops with WVDEP UIC staff to validate workflows and edge cases. System architecture design review and approval. 40 CFR Part 146 regulatory encoding begins with UIC SME. Deliverable: Architecture



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Design Document and Regulatory Requirements Traceability Matrix. Milestone: System architecture approval (Week 6).

**Phase 2 — Core Platform Build (Weeks 7-14):** Agentic AI engine development including Digital Intake Specialist, completeness review, and technical compliance agents. GraphRAG knowledge base construction with UIC regulatory corpus. HITL workflow interface and dashboard development. AWS GovCloud environment provisioning and security hardening. Deliverable: Core platform with initial agent capabilities. Milestone: Internal demo to WVDEP (Week 14).

**Phase 3 — Integration and GIS (Weeks 15-18):** Geospatial analysis platform with AoR determination algorithms. External data source integration (WVGES, EPA SDWIS, WV Office of Oil and Gas). Document processing pipeline with OCR, blueprint vision agents, and draft permit generation. Historical data migration from AppEnhancer, ERIS, and ESS. Deliverable: Integrated platform with GIS and data migration complete. Milestone: Integration testing complete (Week 18).

**Phase 4 — Testing and Acceptance (Weeks 19-26):** Functional testing against all mandatory requirements. Section 508 / WCAG 2.1 AA accessibility validation. Security assessment and penetration testing. User Acceptance Testing with WVDEP staff using representative permit applications. Performance and load testing. Deliverable: Test reports and UAT sign-off. Milestone: UAT completion and system acceptance (Week 26).

**Phase 5 — Pilot and Production (Weeks 27-36):** Pilot deployment with live Class I application processing. Supervised operation with DMC team on-call for real-time support. Staff training program execution. Transition to full production operations. 30-day hypercare stabilization period. Deliverable: Production system with trained staff. Milestone: Full production launch (Week 36).

**Risk Mitigation:** Parallel development streams minimize critical path delays. Bi-weekly checkpoint reviews with WVDEP stakeholders provide early visibility into progress and issues. Each phase includes a formal go/no-go gate requiring WVDEP approval before proceeding. Contingency plans with alternative approaches are documented for each phase.

**CERTIFICATION AND SIGNATURE PAGE**

I certify that I have reviewed this Request for Proposal (CRFP 0313 DEP2600000003) in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this proposal for review and consideration; that I am authorized by Data Machines to execute this proposal and any documents related thereto on the company's behalf; that I am authorized to bind Data Machines in a contractual relationship; and that, to the best of my knowledge, Data Machines has properly registered with any State agency that may require registration.



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By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law; and that pursuant to W. Va. Code 5A-3-63, Data Machines is prohibited from engaging in a boycott against Israel.

**Company:** Data Machines

**Authorized Representative Signature:** Lindsay Mercer

**Printed Name and Title:** Lindsay Mercer, Director of Contracts

**Date:** May 27, 2026

**Contact Phone:** (703) 863-0487

**Email Address:** lindsaymercerc@datamachines.com

**ADDENDUM ACKNOWLEDGEMENT FORM**

**SOLICITATION NO.:** CRFP 0313 DEP2600000003

I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specifications, etc.

**Addendum Numbers Received: (Check the box next to each addendum received)**

- Addendum No. 1  Addendum No. 2  Addendum No. 3  Addendum No. 4  Addendum No. 5
- Addendum No. 6  Addendum No. 7  Addendum No. 8  Addendum No. 9  Addendum No. 10

I understand that failure to confirm the receipt of addenda may be cause for rejection of this proposal. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Data Machines representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

**Company:** Data Machines

**Authorized Signature:** Lindsay Mercer

**Date:** May 27, 2026

**DESIGNATED CONTACT**

Data Machines appoints the following individual as the Contract Administrator and initial point of contact for matters relating to this Contract:

Lindsay Mercer, Director of Contracts, Data Machines, 12100 Sunset Hills Rd, STE 605, Reston, VA 20190

**Phone:** (703) 863-0487 | **Fax:** (703) 636-2341 | **Email:** lindsaymercerc@datamachines.com



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**Technical Point of Contact:**

Edward Mahoney, Technical Program Manager, Data Machines, 12100 Sunset Hills Rd, STE 605, Reston, VA 20190

**Phone:** (508) 265-4271 | **Email:** edmahoney@datamachines.com

**Emergency Contact (24/7):** **Phone:** (844) DMC-CORP (362-2677)

**Email:** emergency@datamachines.com

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**End of Technical Proposal**

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