

DISTRICT-WIDE INCORPORATION OF GSR INTO LOUISVILLE DISTRICT FUDS PROJECTS

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GREEN AND SUSTAINABLE REMEDIATION (GSR) IN THE FUDS PROGRAM

- FUDS policy
 - USACE Environmental Regulation (ER) 200-3-1: Comply with the Department of Defense (DoD) guidance and directives
- GSR encouraged, not required
 - DoD policy [2012 Defense Environmental Restoration Program (DERP) Manual]
 - To consider and implement GSR “when feasible” and where “practicable based on economic and social benefits and costs”, apply across the entire remedial cycle
 - Also not required by EPA



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IF NOT REQUIRED, THEN WHY INCLUDE?

Challenge – How to persuade project teams to include GSR when it is not required

- Emphasize benefits
- Comprehensive but not time-consuming GSR evaluation



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BENEFITS FOR FUDS PROJECTS

- Army-USACE HQ calls for examples of GSR
- Factor for award of plus-up FUDS funds
- Benefits
 - Reduces energy consumption
 - Reduces toxic air emissions
 - Reduces waste generation
 - Conserves water and natural resources
 - Reduces ecological impact
 - Reflects good environmental stewardship
 - Helps gain public acceptance and confidence building
 - Reduces costs



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SIMPLIFIED GSR EVALUATION

GSR Best Management Practice (BMP) Checklist

- Developed in 2016 by EM CX
- Uses GSR BMP list from 2012 Army Study
 - 66 BMPs over 8 remedial activity areas
 - Methodologies that are inherently GSR
 - Specific investigative and remedy practices that conserve/protect resources
- Excel spreadsheet documents the applicability, selection, and implementation process
 - Yes/No pick lists
 - Comment columns with either specific BMP application or reason why BMP not applicable, selected or implemented
 - Cost and schedule impact (increase, no change, decrease, unknown)



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GSR BMP CHECKLIST

Erase ALL Entries	Clear All Sort/Filters	Filter "YES" Applicable	Sort on	Filter "YES" Selected	Filter "YES" Implemented	Implemented=Yes	Implemented=Yes	Show Next Step		
		Filter "No" not Applicable	Priority	Filter "No" not Selected	Filter "No" not Implemented	Sort on Cost	Sort on Impact	Reset Formatting		
Site, Project, Phase		Applicable?	Priority	Selected?	Implemented?	Cost Impact	Schedule Impact	Comments		
Category	Best Management Practice	Y/N	H/M/L	Y/N	Enter Rationale if Not Selected	Y/N	Enter Rationale if Not Implemented	(select from list)	(select from list)	
B: Characterization and/or Remedy Approach										
Characterization and/or Remedy Approach	BMP B-3: Use appropriate characterization or remedy approach based on site conditions	Yes	Conduct tracer study to determine best injection program	High	Yes		Yes	Decrease	Decrease	Although increase in cost for study, lower overall cost as less material needed to be injected, also shorter time to reach remedial goals
Characterization and/or Remedy Approach	BMP B-4: Establish decision points to trigger a change from one technology to another or from one remedy alternative to another	Yes	Active remediation followed by monitored natural attenuation	High	Yes		No	Decision deferred to monitoring phase to see if rebound occurs		Expected cost decrease when shift to MNA occurs
D: Energy/Emissions Equipment Use										
Energy/ Emissions Equipment Use	BMP D-7: Consider purchase of renewable energy certificates (RECs) to offset emissions from the remedial activities (note that a Memorandum titled Department of the Army Policy for Renewable Energy Credits, dated 24 May 2012, states that "the Army shall not purchase RECs solely to meet Federal renewable energy goals," but it is possible that Project Teams might in some cases consider the purchase of RECs to address concerns of one or more stakeholders at a specific site)	Yes	Purchase of RECs	Low	No	Policy did not allow				
E: Material & Off-Site Services										
Material & Off-Site Services	BMP E-4: Identify opportunities for using by-products or "waste" materials from local sources in place of refined chemicals or materials	Yes	Local availability of waste "Pepsi" water	Medium	Yes		Yes	Decrease	Decrease	Although Pepsi water was not available (emulsified vegetable oil (EVO) was substituted), the EVO was locally available
F: Water Resource Use										
Water Resource Use	BMP F-3: Use extracted and treated water for beneficial purposes	No	No extracted groundwater							
G: Waste Generation, Disposal, and Recycling										
Waste Generation, Disposal, and Recycling	BMP G-3: Consider on-site treatment and re-use of soil instead of off-site disposal	No	No soil remediation							
I: Safety and Community										
Safety and Community	BMP I-7: Contribute to local economy when possible	Yes	Use local drill crews for injection of substrate	Low	Yes		Yes	Decrease	Decrease	

DRAFT FUDS GSR APPROACH

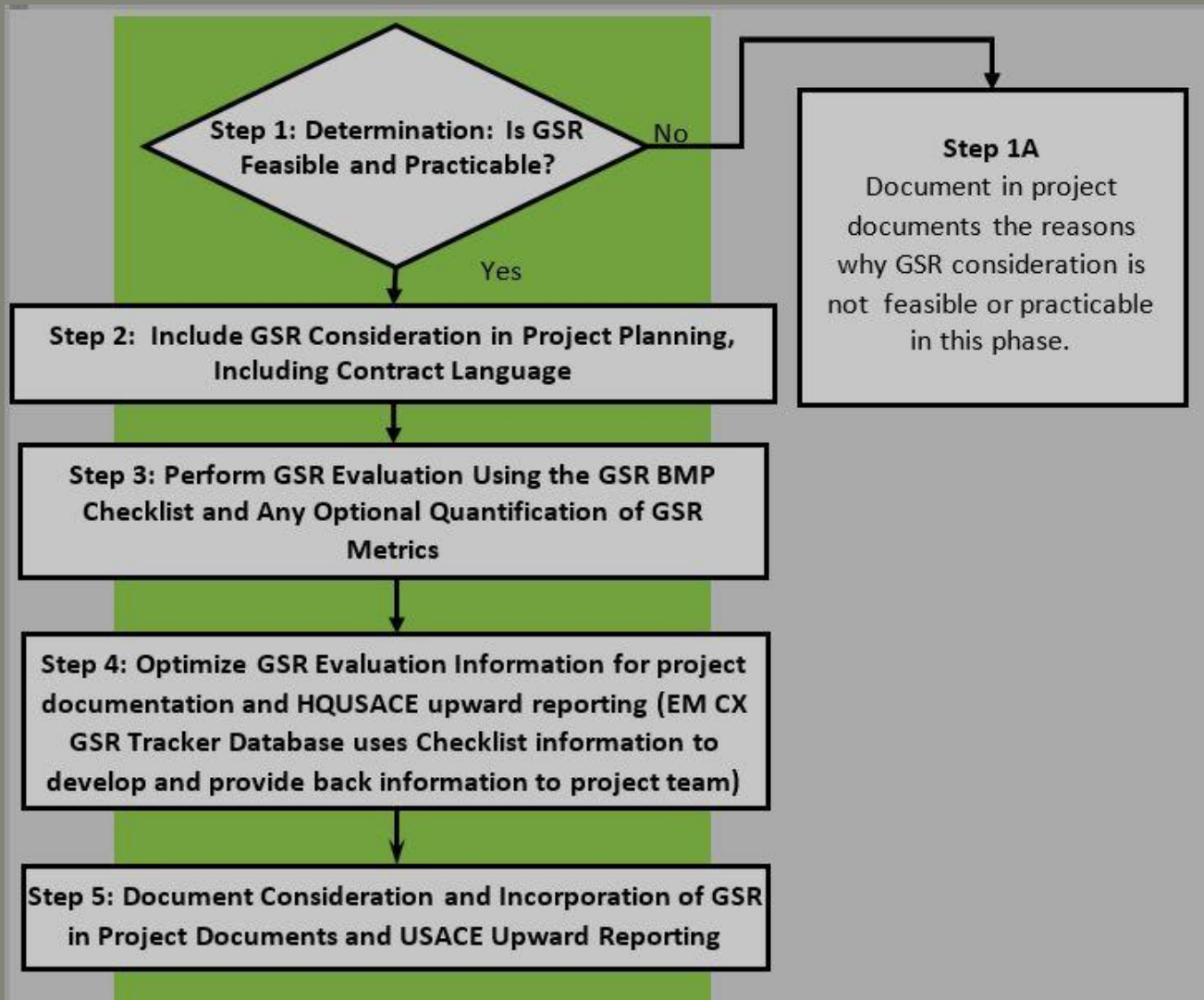
- Developed in 2016 by EM CX
- Uses GSR Checklist
- Approach Pilot started with Louisville District 2016



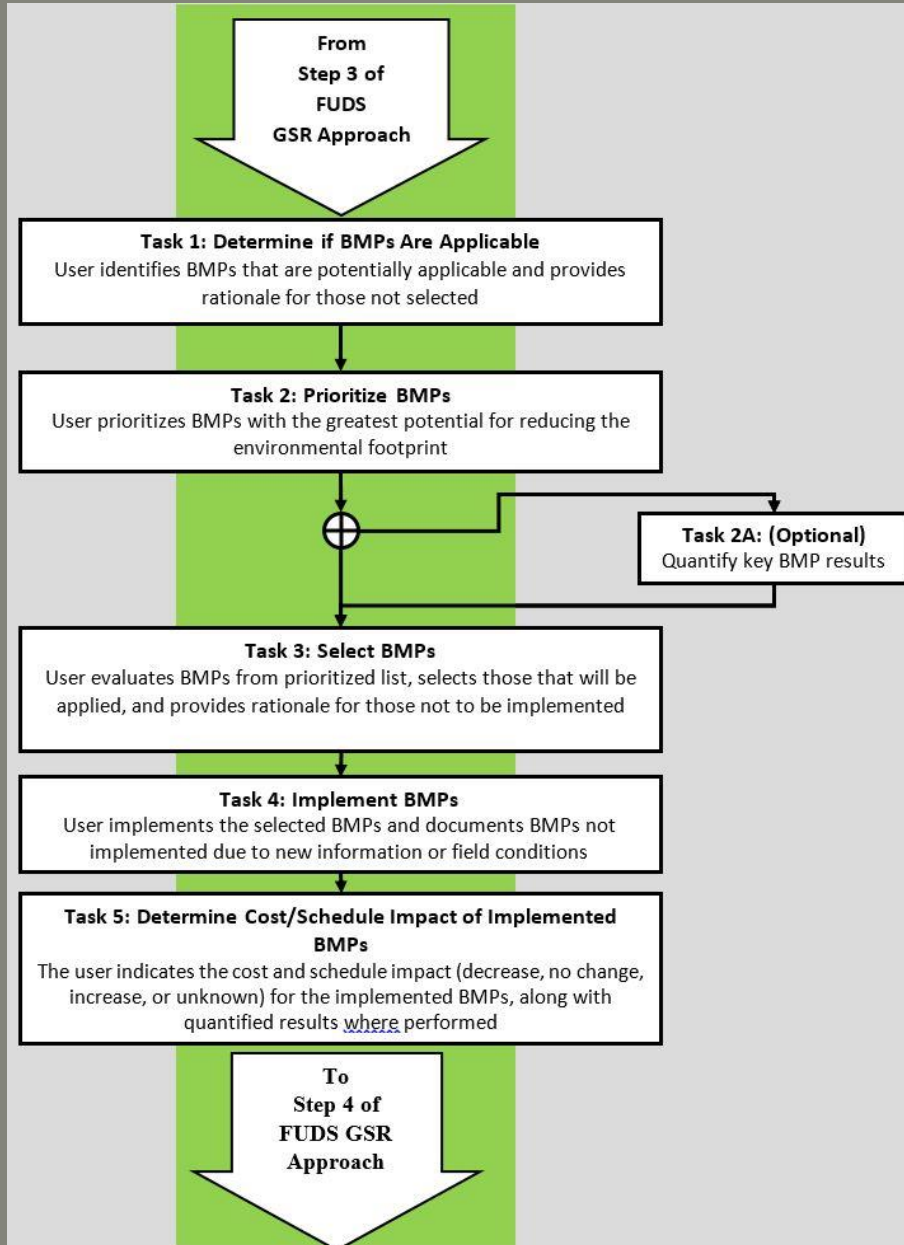
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FUDS GSR APPROACH



GSR EVALUATION



GSR IN LOUISVILLE DISTRICT

2012 Army (OACSIM) GSR Study

- Former Lockbourne Air Force Base (AFB) Landfill Study pilot
- GSR contract language developed concurrent with Study

2012- 2014 – GSR language included in Louisville District projects

2016 – Contract language updated and consolidated

- Best Management Practice (BMP) Checklist – core activity
- Pilot - GSR language required for all future Louisville FUDS contracts
- Contract language supplied to other districts (Buffalo, Chicago, Detroit, Huntington, Nashville, and Pittsburgh) within Great Lakes and Ohio River Division (LRD) to expand pilot



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EXAMPLE GSR CONTRACT LANGUAGE

Example GSR Contract Language for a Performance-Based Acquisition

Consistent with DoD policy (DoD Manual 4715.20, Defense Environmental Restoration Program (DERP) Management, 9 Mar 2012 (<http://www.dtic.mil/whs/directives/corres/pdf/471520m.pdf>), it is USACE's goal to consider, to the extent practicable, Green and Sustainable Remediation (GSR) practices in all phases of this project, and to implement GSR practices when feasible.

Within the FUDS CERCLA regulatory framework, statutory requirements (e.g., CERCLA evaluation criteria) for this project shall take precedence when considering and implementing GSR practices.

All work performed under this Contract shall comply with DoD Manual 4715.20.

Where applicable, the Contractor shall follow the attached "2016 FUDS GSR Approach".

To the extent practicable, the Contractor shall consider GSR practices to: *[Add any other GSR goals specific to the project.]*...

The Contractor shall implement GSR practices when feasible and practical, per DoD policy.

The Contractor may be encouraged to develop, plan, and implement additional GSR approaches to the work.

The Contractor shall complete the attached fillable GSR BMP Excel-based spreadsheet and any associated summary text. All work plans and reports generated by the Contractor in performance of task orders on this contract shall document for the relevant scope of work using the above referenced spreadsheet

- GSR BMPs considered but later in the process not selected or implemented
- Documentation of the reasons why GSR BMPs considered were not selected and/or implemented
- GSR BMPs that were implemented
- The cost impact (cost savings, cost neutral, cost increase, unknown) of the BMPs implemented
- The schedule impact (decrease, no change, increase, unknown) of the BMPs implemented

[Option] The Contractor shall perform and compare the results from quantitative footprinting on the following...

EXAMPLE GSR CONTRACT LANGUAGE

GSR Evaluation Factor *[Include in solicitation Evaluation Factors for Award (for MATOCs/SATOCs, in Section M). The Project Team is responsible for establishing the weighting/relative importance of this factor.]*

The proposal shall demonstrate:

Project and personnel experience reflecting expertise in GSR approaches to investigation and remediation;

Thorough consideration of GSR in all aspects of the sample problem *[if applicable]* technical approach and project execution, and provision of logic for acceptance or rejection of their implementation; and

Understanding of the procedures for tracking and documenting GSR throughout the contract.

Example only. Project-specific contract language should be reviewed by the project Contracting Official and/or Office of Counsel.



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LOUISVILLE DISTRICT CURRENT STATUS

GSR BMP list (before the Checklist) considered and implemented, quantitative footprinting included on two FUDS projects

- Raco Army Airfield – Hiawatha National Forest (E05MI0026) RI/FS
- Lockbourne Air Force Base (G05OH0007) Multiple Sites RI/FS

GSR contract language included in five more Louisville District projects

- Kincheloe Air Force Base (E05MI0025) Landfill 1 Additional RI
- Kincheloe Air Force Base (E05MI0025) Fuel Storage Area RI/FS, PP, DD
- Nike D-51 Grosse Ile Naval Air Station (E05MI0123) Site Soil Contamination RI
- Nike CD-78 Oxford (G05OH0046) Former Silo Remedial Action – Operation (RA-O)
- Nike D-97 Oakland Community College (E05MI0120) Supplemental Site Inspection

GSR BMP Checklist, FUDS project near completion

- Former Lockbourne AFB Landfill Remedial Construction



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RESULTS TO DATE – FUDS GSR BMP INCLUSION

- BMPs - 60% cost decrease, 30% cost neutral, 10% cost increase
 - Raco AAF RI
 - 48 GSR BMPs implemented
 - 27 with significant cost savings (no cost increase)
 - Lockbourne AFB AOCs RI
 - 53 GSR BMPs implemented
 - 26 with significant cost savings, 5 with cost increase
- Time to complete GSR BMP Checklist
 - Range 1-5 hours (longer times for those not familiar with Checklist)
 - Average time 3 hours



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PILOT STUDY CURRENT STATUS

- From GSR checklists, EM CX GSR database will provide to the LRD for project documentation
 - The BMPs considered and implemented
 - The overall number of BMPs considered and implemented
 - Cost and schedule impact of implemented BMPs
- LRD FUDS projects in the FUDS Optimization Approach will use the GSR BMP Checklist



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PATH FORWARD

- Continued LRD completion of GSR Checklists
- Ongoing results from FUDS GSR pilot used to revise the FUDS GSR Approach
- Final GSR Approach incorporated into USACE guidance (2018-19)
 - Revised Interim Guidance (IG) or Engineering Manual
 - Will replace the 2010 USACE GSR IG



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RESOURCES

Department of Army, Office of the Assistant Chief of Staff for Installation Management Army Detailed Approach (DoA 2012), “Evaluation of Consideration and Incorporation of Green and Sustainable Remediation (GSR) Practices in Army Environmental Remediation, Appendix A “Detailed Approach for Evaluating Green And Sustainable Remediation (GSR) on Army Environmental Projects”, August 2012,

http://www.fedcenter.gov/Documents/index.cfm?id=22322&pge_prg_id=27392

Department of Defense (DoD 2012) “Defense Environmental Restoration Program (DERP) Manual”, revised 9 March 2012, No. 4715.20

<http://www.dtic.mil/whs/directives/corres/pdf/471520m.pdf>

US Army Corps of Engineers (2004) “Environmental Quality Formerly Used Defense Site (FUDS) Program Policy”, Engineering Regulation ER 200-3-1, 10 May 2004, [http://asktop.net/wp/download/28/ER%20200-3-](http://asktop.net/wp/download/28/ER%20200-3-1%20Enviromental%20Quality%20Formerly%20Used%20Defense%20Sites%20FUDS%20Program%20Policy.pdf)

[1%20Enviromental%20Quality%20Formerly%20Used%20Defense%20Sites%20FUDS%20Program%20Policy.pdf](http://asktop.net/wp/download/28/ER%20200-3-1%20Enviromental%20Quality%20Formerly%20Used%20Defense%20Sites%20FUDS%20Program%20Policy.pdf).



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QUESTIONS



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