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CLIENT LOGO IF APPLICABLE

GYSBI PMO

SCOPE OF WORK

CLIENT: Guyana Shore Base Inc.

BUSINESS UNIT: Operations

SITE / ASSET: Water Treatment Plant (WTP)

PROJECT TITLE: Replacement of Water Filter Media

PROJECT NO: GY01-0024

DOCUMENT NO: GY01-0024-PM-SOW-001-01
REVISION: A1

CONTENTS

REVISION / ISSUE TABLE:

REV	ISSUE DATE	DESCRIPTION	INITIATED	REVIEWED	APPROVED
A1		ISSUED FOR INTERNAL REVIEW & COMMENT	GP	NN	SJL
C1		ISSUED FOR IMPLEMENTATION	GP	NN	SJL

REVISION HISTORY:

REVISION	SUMMARY OF CHANGES MADE	SECTIONS AFFECTED
-		

INTERNAL DISTRIBUTION LIST:

ID	NAME	TITLE	DEPT	REV
1	Stephen Lumsley	AES Director	AES	C1
2	Najuma Nelson	Project Services Manager	AES	C1
3	Rick Shafers	Operations Director	Operations	C1
4	Mark Clarkson	Operations Superintendent	Operations	C1
5	Steve Clark	Operations Superintendent	Operations	C1
6	Dave Kaiser	AES Services Manager	AES	C1
7	Russell Carter	AES Services Manager	AES	C1
8	Mahendra Mentore	Project Manager	AES	C1

EXTERNAL DISTRIBUTION LIST:

ID	NAME	TITLE	COMPANY	REV
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3				
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TABLE OF ACRONYMS & TERMS:

ACRONYM	MEANING
BOQ	Bill of Quantities
DPR	Daily Progress Report
FRP	Fibre-Reinforced Plastic
GOARC	GYSBI Permit-to-Work / operational control process
GYSBI	Guyana Shore Base Inc.
HSE	Health, Safety and Environment
HSSE	Health, Safety, Security and Environment
ITP	Inspection and Test Plan
JSA	Job Safety Analysis
LOTO	Lockout / Tagout
LS	Lump Sum
OEM	Original Equipment Manufacturer
PA	Performing Authority
PEP	Project Execution Plan
PMO	Project Management Office
PO	Purchase Order
PPE	Personal Protective Equipment
PTW	Permit to Work
QA/QC	Quality Assurance / Quality Control
QHSSE	Quality, Health, Safety, Security and Environment
RFQ	Request for Quotation
SDS	Safety Data Sheet
SIMOPS	Simultaneous Operations
SOW	Scope of Work
TDS	Technical Data Sheet
WBS	Work Breakdown Structure
WTP	Water Treatment Plant

1 PURPOSE

This Scope of Work (SOW) defines the technical and execution requirements for removal and replacement of granular filter media in the two redundant containerized water treatment plant (WTP) filter systems at Guyana Shore Base, Georgetown, Guyana.

The SOW establishes the scope boundaries, outage sequencing, HSE/QHSSE controls, inspection and hold points, deliverables, responsibilities, commissioning requirements and acceptance criteria. It is intended to form part of the RFQ and subsequent contractual work package.

Referenced Documents:

- PM-PO-001 PMO Governance Policy
- PM-PR-003 Project Lifecycle Procedure
- PM-PR-006 Change Management Procedure
- PM-TM-014 Project Execution Plan
- Project reference documents listed in Appendix D of this SOW

2 PROJECT OVERVIEW

The project identifiers below shall align with the Project Charter, procurement documents and commercial documentation.

FIELD	INFORMATION
Project Title	Replacement of Water Filter Media
Project Code	GY01-0024
Client / End User	Guyana Shore Base Inc. (GYSBI)
GYSBI Project Manager	Mahendra Mentore
Contractor	*(to be completed upon award)*
Contract / PO Number	*(to be assigned)*
Location / Site	Guyana Shore Base, Georgetown, Guyana
Project Type	Maintenance / Water Treatment
SOW Revision	A1

The WTP has two separate redundant filter lines. Each line is housed in a 40 ft ISO container and contains six pressure filters: three sand/gravel filters followed by three filters containing support gravel, Pyrolox/manganese media and activated carbon. Only one WTP filter line may be unavailable at any time; the second line shall remain available until the first line is reassembled, commissioned, accepted and returned to service.

3 DETAILED SCOPE OF WORK

The Contractor shall execute the work described below and shall allow for the labor, supervision, equipment, temporary works, consumables, HSE/QHSSE controls, testing and records necessary to complete the scope.

3.1 Project Description

The project consists of replacing spent granular filter media in twelve pressure filters while maintaining WTP operational redundancy.

- Two 40 ft containerized WTP filter lines, six pressure filters per line.
- Industrial-vacuum removal, vessel cleaning/inspection, controlled media reloading, temporary pipework access works, backwash, testing and commissioning.
- One filter line shall be fully completed, accepted and returned to service before the second line is isolated.

3.2 Technical Requirements

The following technical requirements are mandatory unless a written GYSBI clarification or approved change states otherwise:

- Existing arrangement: 12 pressure filters total. Positions 1-3 in each line are sand/gravel filters; positions 4-6 use support gravel, Pyrolox/manganese media and activated carbon.
- Media loading basis: support gravel 0.42 m (height) / 425 L per vessel; filter sand 0.54 m (height) / 950 L per sand-filter vessel for each gravel and sand filter.
- Media loading basis: Pyrolox 0.12 m (height) / 211 L and activated carbon 0.53 m (height) / approximately 937 L per for each carbon-filter vessel.
- Before any vessel is emptied, GYSBI and the Contractor shall jointly verify Owner-supplied media identity, package size and available quantity. Final loading acceptance is by specified bed depth/volume per vessel, not historical media mass.

- Spent media shall be removed using an industrial vacuum suitable for wet/damp granular media and the applicable dust hazards. Ordinary shop vacuums, compressed-air cleaning and dry sweeping are not acceptable.
- At the last three filters in each container, field-verify the obstructing drain/header line; remove only the minimum section required for safe access, then reinstate compatible pipe/fittings/supports and complete a leak test.
- Clean each vessel and inspect accessible FRP surfaces, lower and upper strainers/distributors, nozzles, flanges and disturbed fasteners. Use borescope/remote camera where required and provide photographs. Strainer defects are a GYSBI hold point.
- Protect lower strainers during reloading: establish a clean-water cushion, lower gravel through a loading sock/hose/chute or equivalent controlled method, distribute media evenly and verify each layer before placing the next layer. Direct super-sack dumping is prohibited.
- Control Pyrolox and activated-carbon dust. No person shall enter a vessel containing wet activated carbon. Follow approved product requirements for initial backwash/rinse and media conditioning.
- Reassemble all disturbed openings and connections, replace disturbed gaskets/seals with new compatible items unless GYSBI approves reuse, refill slowly, vent trapped air and inspect for leakage.
- Commission each completed line through normal service and backwash functions. Submit loading, inspection, leakage, backwash and commissioning records; obtain GYSBI acceptance of the first line before isolating the second line.

3.3 Applicable Laws, Codes & Standards

The Contractor shall perform the work in compliance with all applicable laws, regulations, GYSBI site requirements, OEM instructions and product safety/technical information relevant to the work, including:

- Applicable Guyana requirements for labour, safety, environment and contractor work at the site.
- Current GYSBI QHSSE, site access/induction and Permit-to-Work / GOARC requirements.
- NOMAD-O Operator Manual - WTP Guyana GYSBI Shorebase.
- Pyrolox/manganese-media TDS and SDS, and Carbon COL-L60 8x30 mesh data sheet and SDS.
- Sand/gravel SDS information, gravel SDS and the issued gravel sieve-test reference.

Appendix A and Appendix C identify the project-specific laws, standards, technical references and design/loading basis to be used for this work.

Referenced Documents:

- PM-TM-019 Quality Management Plan
- PM-TM-020 HSE Management Plan

3.4 Permits, Licences & Approvals

The work is primarily controlled through GYSBI site approvals and operational permits. The Contractor shall identify any additional statutory permit or notification required by its method and shall not commence affected work until approval is in place.

- GYSBI site access, induction, contractor approval/prequalification and required Local Content documentation/status.
- Approved Permit to Work / GOARC authorization before field work.
- GYSBI-coordinated isolation/LOTO, depressurization, drain-down and zero-energy verification before opening vessels or cutting pipework.

Additional conditional approvals include:

- Confined-space entry is strictly prohibited. Vessel entry is not part of the base scope.
- GYSBI release to take the second WTP line out of service only after the first line is commissioned, accepted and operating.
- GYSBI approval of any repair/replacement of damaged strainers/laterals or work beyond the defined base scope.
- The Permits & Approvals Register in Appendix B shall be maintained for the work.

3.5 Construction & Execution Requirements

Site execution shall be planned for the restricted containerized work environment and ongoing WTP operations, including:

- Attend the mandatory site walkdown and field-verify access, hose routing, vessel openings, pipe sizes/materials, drain/header interference, handling routes, power, drainage and staging areas unless GYSBI formally waives the visit in writing.
- Maintain the one-system-at-a-time outage restriction and provide sufficient labor/equipment to minimize downtime.
- Protect the in-service WTP line, electrical cabinets, instruments, piping, floors and adjacent equipment against dust, impact, water and contamination.
- Establish barricades and controlled access while maintaining clear emergency egress, suitable lighting, housekeeping and hose/cable management inside the container.
- Provide temporary ventilation and effective vacuum dust collection; use suitable respiratory/eye/skin protection and provide an appropriate eyewash arrangement where exposure cannot otherwise be controlled.
- Use mechanical handling for super sacks and heavy media; suspended loads shall not pass over personnel or operating equipment.

- Contain residual water and wash water and prevent uncontrolled discharge to soil, stormwater or drains. Keep spent media segregated where reasonably practicable unless GYSBI approves commingling.
- Media filters shall be manually loaded in a controlled manner.
- Use cold-cutting methods where practicable for thermoplastic/PVC-type pipework and coordinate all isolation, reinstatement, testing and return-to-service activities with GYSBI Operations.

Referenced Documents:

PM-TM-020 HSE Management Plan

PM-PF-006 Construction Execution Flow

4 IN-SCOPE WORK

The following work is included in the Contractor base scope and shall be coordinated with the WBS and commercial pricing schedule:

- Pre-mobilization planning and submittals, site verification, mobilization, protection, PTW/LOTO support, line isolation support, depressurization and drain-down.
- Industrial-vacuum removal of spent media from all 12 filters; vessel cleaning and inspection; temporary removal/reinstatement of obstructing drain/header piping; controlled reloading of Owner-supplied gravel, sand, Pyrolox and activated carbon.
- Reassembly, gasket/seal replacement where disturbed, leak testing, backwash/rinse, disinfection when directed, functional testing and commissioning of each WTP line in the mandatory sequence.
- Disposal of media at an off-site location.
- All required supervision, labor, vacuum equipment, receivers, hoses, dust collection, ventilation, lighting, access equipment, lifting aids, PPE, tools, consumables, waste containment/transfer, inspection records, daily reports, photographs and final closeout documentation.

The Contractor shall restore all disturbed piping, supports, valve access, labels, floors and work areas to equal or better condition than before the work.

5 OUT-OF-SCOPE WORK

The following items are excluded from the Contractor base scope unless specifically instructed, approved and commercially authorized by GYSBI:

- Procurement of replacement filter media; the replacement media is Owner-supplied by GYSBI.
- Repair or replacement of damaged internal strainers/laterals discovered after media removal, except when separately instructed using approved provisional/unit-rate terms.
- Replacement of existing drain/header pipework beyond the minimum section required to obtain safe access, unless separately directed.
- Confined-space vessel entry is strictly prohibited.
- Work to adjacent systems/facilities.

6 WORK BREAKDOWN STRUCTURE (WBS)

The WBS provides the framework for planning, pricing, scheduling, progress measurement, reporting and change control.

6.1 WBS Overview (Level 2)

1.0 Pre-Mobilization and Controls

2.0 WTP Line 1 Filter Media Replacement

3.0 WTP Line 2 Filter Media Replacement

4.0 Commissioning, Closeout and Provisional Works

6.2 Detailed WBS

The Level 3+ WBS in Appendix E shall be used to align the work sequence, deliverables and commercial schedule, including:

- Cost estimating and tender pricing
- Progress measurement by work package
- Daily/weekly reporting and schedule updates
- Risk, issue, change and variation control

Referenced Documents:

PM-TM-008 WBS Template

PM-TM-009 Schedule Template

PM-TM-010 Project Cost Estimate Template

7 DELIVERABLES

The Contractor shall produce the following minimum documents, records and outputs as part of the scope. Appendix F provides the detailed Deliverables Register.

Deliverable	Type (Eng / Const / QC / Handover)	Responsible Party	Due Stage	Notes
Method Statement; JSA/HSE; LOTO plan	CONST / HSE	Contractor	Pre-mob	GYSBI approval
ITP and HP-1 to HP-9 register	QC	Contractor	Pre-mob	GYSBI approval
Programme; manpower/equipment and equipment data	CONST	Contractor	Pre-mob	Accepted before mobilization
Daily reports; inspection/photos; media records	CONST / QC	Contractor	Daily / vessel	Complete and traceable
Pipe leak-test; backwash and commissioning records	QC	Contractor	Each line	Line accepted by GYSBI
Waste records; closeout dossier and punch list	Handover	Contractor	Final	Complete and accepted

8 SCOPE GOVERNANCE & CONTROL

This section establishes the scope-control rules to be applied through execution and closeout.

8.1 Scope Baseline

The scope baseline consists of this SOW, the WBS, Deliverables Register, applicable reference documents, issued clarifications/addenda, and approved project-specific Method Statement/ITP where these do not alter the contractual scope. This baseline is the reference for evaluating work and changes.

8.2 Scope Monitoring

The Project Manager and PMO shall monitor:

- Progress against the one-line-at-a-time outage sequence and defined WBS.
- Contractor interpretation of the base scope, provisional items and Owner-supplied media responsibilities.
- Completion and acceptance of hold points, media-loading records, commissioning records and required deliverables.

Suspected scope creep, unexpected strainer defects, additional pipework work or other changes shall be stopped/reviewed and processed through formal change control before execution.

8.3 Scope Change Control

No change to this SOW, including instructed repairs or additional work beyond the defined base scope, shall be implemented without formal GYSBI approval in accordance with the Change Management Procedure.

All changes shall be:

- Identified and described in writing
- Assessed for cost, schedule, HSE/QHSSE and quality impact
- Reviewed by PMO / Commercial / Engineering as required

- Approved by the designated authority (GYSBI / client)
- Logged in the Change Log and Variation Register
- Reflected in updated versions of the SOW and related documents

Referenced Documents:

- PM-PR-006 Change Management Procedure
- PM-TM-029 Change Management Plan
- PM-PF-003 Change Control Workflow
- PM-FO-002 Change Request Form
- PM-FO-003 Variation Request Form (Contractor)
- PM-FO-004 Variation Assessment Form (PMO)
- PM-TM-040 Variation Register Template

9 ACCEPTANCE & VERIFICATION

GYSBI will verify satisfactory completion through the approved ITP, mandatory hold points, commissioning results, documentation and final handover.

Acceptance will be based on:

HOLD POINT(S)	STAGE	ACCEPTANCE / VERIFICATION CRITERIA
HP-1	Pre-mobilization	approved Method Statement, HSE/JSA, ITP, equipment data, work sequence and schedule.
HP-2 / HP-3	Media inventory and isolation	delivered media verified; selected line isolated/LOTO, depressurized and drained; remaining line confirmed available.
HP-4	Vessel inspection	each vessel clean; strainers/distributors and FRP inspected; photographs accepted; defects dispositioned before loading.
HP-5 / HP-6	Media loading	support gravel and final media layer depth/volume/freeboard verified and recorded for each vessel.
HP-7 / HP-8	Reassembly and first-line commissioning	closures, gaskets and reinstated pipework verified; line leak-free, backwashed/rinsed, functional and accepted before second-line outage.
HP-9	Final completion	second line commissioned; required records, waste transfer/disposal documents and punch-list items complete.

No work will be considered complete until the applicable hold points are released, both WTP lines are returned to service, required records are accepted and the final punch list is closed.

Referenced Documents:

- PM-TM-019 Quality Management Plan
- PM-TM-020 HSE Management Plan

10 INTERFACES & DEPENDENCIES

Key interfaces and dependencies affecting the scope are identified below and shall be managed through the project Interface Register.

Primary interfaces:

- GYSBI Operations - outage designation, operating-line availability, LOTO/isolation, drain-down, return to service and commissioning acceptance.
- GYSBI procurement/staging - Owner-supplied replacement-media delivery and joint inventory before the first outage.
- Contractor Site Supervisor / Performing Authority - PTW/GOARC administration, work coordination and day-to-day HSE/quality records.
- GYSBI waste/staging arrangements - location and instructions for spent-media containment, transfer and disposal.
- OEM/product references - media loading, safety, backwash and commissioning requirements.

Appendix H provides the structured Interface Register for these dependencies.

Referenced Document:

- PM-TM-025 Interface / Communication Management Plan

11 ROLES & RESPONSIBILITIES

The principal responsibilities for scope delivery and control are as follows:

- GYSBI Project Manager - accountable for overall scope delivery, approvals, change control and acceptance.
- GYSBI Operations - authorize the outage sequence; coordinate isolation/LOTO, operating-line availability, refill/return to service and commissioning witness/acceptance.
- GYSBI QHSSE / Permit Authority - administer site access, PTW/GOARC and applicable HSE/QHSSE requirements.
- Contractor Site Supervisor / Foreman / Performing Authority - direct the work, maintain permits, coordinate labor/equipment and ensure compliance with the SOW and approved Method Statement.
- Contractor HSE / Quality Coordination - maintain JSA/toolbox, ITP, hold-point, inspection and quality records; one competent accepted representative may coordinate these functions unless GYSBI requires otherwise.
- PMO / Commercial / Engineering - provide governance and review technical issues, scope changes, variations and related commercial impacts as required.

Referenced Document:

- PM-MN-001 PMO Handbook

12 SCOPE-RELATED RISKS

Key scope-related and execution risks requiring active control include:

- Loss of WTP redundancy or extended outage if the second line is isolated before the first line is fully accepted and operating.
- Insufficient or incorrectly identified replacement media if the Owner-supplied inventory is not jointly verified before media removal.
- Restricted access and lower-header pipe congestion inside the 40 ft containers, affecting hose routing, handling and safe work positioning.
- Respirable silica/manganese dust, activated-carbon combustible dust and oxygen depletion associated with wet activated carbon.
- Damage to internal strainers/laterals during vacuum removal or uncontrolled media reloading, or hidden defects discovered after media removal.
- Leakage, contamination or delayed return to service following temporary pipework removal, gasket disturbance or incomplete reassembly/testing.

These risks shall be tracked in the Project Risk & Issue Register and controlled through the Method Statement, JSA, ITP/hold points, outage sequence and GYSBI approvals.

Referenced Documents:

PM-TM-018 Risk Management Plan

PM-TM-011 Risk & Issue Register Template

13 REPORTING REQUIREMENTS

The Contractor shall provide concise, traceable reporting sufficient to demonstrate progress, quality, HSE/QHSSE compliance and scope control.

Minimum reporting requirements:

- Daily progress report showing manpower, work completed, filter/vessel status, outage status, constraints and planned next activities.
- Daily JSA/toolbox and applicable PTW/LOTO records.
- Progress and inspection photographs, including before/after vessel condition and media-loading verification records.
- Updated detailed work programme when progress or outage sequencing materially changes.
- Status of defects, hold points, change/variation requests, waste transfer/disposal, commissioning and final closeout deliverables.

Referenced Documents:

- PM-PR-007 Reporting & Communication Procedure
- PM-TM-035 Monthly Report Template
- PM-TM-036 Weekly Report Template
- PM-TM-038 Meeting Minutes Template

14 APPENDICES

The appendices form an integral part of this SOW. Only approved and current information shall be used for execution.

Appendix structure:

APPENDIX	DESCRIPTION
A	Applicable Laws, Codes & Standards Register
B	Permits, Licences & Approvals Register
C	Engineering & Design Basis / Design Standards Register
D	Drawings & Specifications Index
E	Detailed WBS (Level 3+)
F	Deliverables Register
G	Change Log & Variation Register (Extract)
H	Interface Register
I	Risk & Issue Register
J	Handover & Acceptance Checklist
K	Bill of Quantities (BOQ)
L	GYSBI-Supplied Filter Media
M	Photographic Reference

Appendix A – Applicable Laws, Codes & Standards Register

Register of project laws, site requirements, OEM/product references and GYSBI specifications applicable to the work.

REF. NO.	LAW / REGULATION / CODE / STANDARD	ISSUING AUTHORITY	APPLICATION TO PROJECT	MANDATORY (Y/N)	NOTES
A01	Applicable Guyana laws and regulations	Government of Guyana	Labour, safety, environment and site work compliance	Y	Contractor to confirm latest applicable requirements
A02	GYSBI QHSSE Policies and Services package	GYSBI	Site access, induction, contractor HSE/QHSSE and reporting	Y	Latest project-specific issue
A03	GYSBI PTW / GOARC requirements	GYSBI	Work authorization, permits and operating controls	Y	Current site system
A04	NOMAD-O Operator Manual - WTP Guyana GYSBI Shorebase	OEM / GYSBI	Existing filter arrangement, media layering and strainer references	Y	Latest issued copy
A05	Manganese Filter Media Pyrolox TDS	Manufacturer	Product properties, service/backwash guidance	Y	Latest issued copy
A06	Pyrolox SDS	Manufacturer	Manganese-media hazards, handling, dust controls and PPE	Y	Latest issued copy
A07	Carbon COL-L60 8x30 mesh Datasheet	Manufacturer	Carbon product characteristics, packaging and density	Y	Latest issued copy
A08	Carbon COL-L60 SDS	Manufacturer	Carbon dust, ventilation, PPE and wet-carbon oxygen-depletion warning	Y	Latest issued copy
A09	Sand & Gravel SDS	Southern Products & Silica Co.	Silica-bearing media hazard information	Y	Latest issued copy
A10	Gravel SDS	Supplier	Aggregate dust, handling and vacuum-cleanup guidance	Y	Latest issued copy
A11	Gravel Sieve Test Results - 1/4 x 1/8	Supplier / Test source	Granular filter-material grading reference	Y	Issued reference
A12	Project-specific Instructions to Bidders / Bid Data and issued addenda	GYSBI	Tender administration and issued clarifications affecting scope	If issued	Use only documents formally issued for this project

Appendix B – Permits, Licences & Approvals Register

Register of required GYSBI site permits, operational releases and conditional approvals associated with the scope.

REF. NO.	PERMIT / APPROVAL NAME	ISSUING AUTHORITY	RESPONSIBLE PARTY (GYSBI/CONTRACTOR)	REQUIRED DATE	STATUS	NOTES
B01	Site access / induction authorization	GYSBI	Contractor	Pre-mobilization	Planned	All personnel
B02	Permit to Work / GOARC	GYSBI	Contractor	Before field work / as required	Planned	Competent Performing Authority
B03	LOTO / isolation and zero-energy release	GYSBI Operations / Permit system	GYSBI / Contractor	Each line outage	Planned	Before vessel opening or pipe cutting
B04	Hot Work Permit	GYSBI	Contractor	If applicable	Conditional	Cold cutting preferred
B05	Confined-Space Entry Authorization	GYSBI	Contractor	Only if separately authorized	Conditional	Not included in base scope
B06	Lifting / handling plan or approval	GYSBI / Contractor	Contractor	Before heavy-media handling as required	Planned	Mechanical handling required
B07	Waste transfer / disposal instruction	GYSBI	GYSBI / Contractor	Before transfer/disposal	Planned	Follow designated staging/disposal route
B08	Release for second WTP line outage	GYSBI Operations	GYSBI	After first line acceptance	Hold	Second line remains available until released

Appendix C – Engineering & Design Basis / Design Standards Register

Project design/loading basis and technical requirements governing the existing WTP filter-media replacement work.

REF. NO.	STANDARD / SPECIFICATION	DISCIPLINE	ORIGIN (ISO/IEC/API/ETC.)	REVISION	APPLICATION TO PROJECT	NOTES
C-01	Existing WTP arrangement	Process / Mechanical	NOMAD-O / GYSBI	Current	2 filter lines; 6 vessels/line	One line remains in service
C-02	Support gravel loading	Process	OEM reference	Current	0.42 m / 425 L per vessel; all 12	Curved-head OEM volume governs
C-03	Filter sand loading	Process	OEM reference	Current	0.54 m / 950 L per sand vessel; 6	Load/accept by depth/volume
C-04	Pyrolox / manganese loading	Process	OEM / Product TDS	Current	0.12 m / 211 L per carbon vessel; 6	Load/accept by depth/volume
C-05	Activated carbon COL-L60 loading	Process	OEM / Product data	Current	0.53 m / approx. 937 L per carbon vessel	Historical mass is not loading target
C-06	Media inventory verification	QA/QC	GYSBI	Current	Jointly verify product/package/quantity	Mandatory before removal
C-07	Protected media loading method	Construction / QC	GYSBI / OEM	Current	Water cushion + controlled sock/hose/chute	No direct super-sack discharge
C-08	Backwash / rinse / commissioning	Process / QC	OEM / Product requirements	Current	Condition media and functionally verify	Records required
C-09	Mandatory outage sequence	Operations	GYSBI	Current	First line accepted/operating before second isolation	Critical dependency

Appendix D – Drawings & Specifications Index

Index of issued reference documents and existing-condition information forming part of the work package.

REF. NO.	DWG / DOC TITLE	DOC NO	DISCIPLINE	REV	STATUS (IFC/IFR)	NOTES
D01	NOMAD-O Operator Manual - WTP Guyana GYSBI Shorebase	B1	Process / Mechanical	Latest	Reference	Existing arrangement and media layering
D02	Pyrolox TDS and SDS	B2 / B3	Process / HSE	Latest	Reference	Product, backwash and hazard information
D03	Carbon COL-L60 Datasheet and SDS	B4 / B5	Process / HSE	Latest	Reference	Product and wet-carbon hazard information
D04	Sand & Gravel SDS / Gravel SDS	B6 / B7	HSE	Latest	Reference	Silica/aggregate dust controls
D05	Gravel Sieve Test Results	B8	Process / QA	Issued	Reference	Grading reference
D06	Project-specific Instructions to Bidders / QHSSE package	B9 / B10	Admin / HSE	As issued	Reference	Tender and site administration requirements

Appendix E – Detailed WBS (Level 3+)

Level 3+ work breakdown aligned with the mandatory outage sequence, quality hold points and commercial work package.

WBS CODE	DESCRIPTION	DISCIPLINE	DELIVERABLE LINK	NOTES
1.1.1	Pre-mobilization planning and controls	Construction / QHSSE	F-01 to F-03	Site walkdown; Method/JSA/LOTO/ITP; schedule; equipment data
2.1.1	WTP Line 1 media replacement	Mechanical / Process / QC	F-04 to F-07	Isolate; pipe access; vacuum; inspect; reload; test; commission
3.1.1	WTP Line 2 media replacement	Mechanical / Process / QC	F-04 to F-07	Begins only after Line 1 acceptance and return to service
4.1.1	Closeout and instructed provisional work	QC / Handover	F-08	Waste records; punch list; final dossier; only authorized additional work

Appendix F – Deliverables Register

Detailed register of the minimum documents and records required for execution, quality verification and handover.

REF. NO.	DELIVERABLE	TYPE (ENG/CONST/QC/ETC.)	RESPONSIBLE PARTY	DUE STAGE	ACCEPTANCE CRITERIA	NOTES
F-01	Method Statement; JSA/HSE; LOTO plan	CONST / HSE	Contractor	Pre-mob	GYSBI approval	Dust, ventilation, lifting, emergency controls
F-02	ITP and hold-point register	QC	Contractor	Pre-mob	GYSBI approval	HP-1 to HP-9
F-03	Programme; manpower/equipment; equipment data	CONST	Contractor	Pre-mob	Accepted	Vacuum, receiver, power, access data
F-04	Joint media inventory record	QC	GYSBI / Contractor	Pre-outage	Verified	Before media removal
F-05	Vessel inspection record and photographs	QC	Contractor	Each vessel	HP release	Strainer / FRP condition
F-06	Media-loading record	QC	Contractor	Each layer	Depth/volume/freeboard verified	Product / lot data where available
F-07	Pipe leak-test and commissioning records	QC	Contractor	Each line	Accepted	Line 1 before Line 2 outage
F-08	Daily/waste records; closeout dossier; punch list	Handover	Contractor	Final	Complete / accepted	All HP and final records

Appendix G – Change Log & Variation Register (Extract)

Project change and variation entries shall be recorded here or by reference to the controlled PM-TM-040 register.

REF. NO.	CHANGE / VARIATION DESCRIPTION	ORIGINATOR	DATE RAISED	IMPACT (COST/SCHEDULE/HSSE)	STATUS	APPROVAL REFERENCE	NOTES
G-01							
G-02							

Appendix H – Interface Register

Key operational, material, site-control and handover interfaces that can affect the work sequence or acceptance.

REF. NO.	INTERFACE DESCRIPTION	INTERFACING PARTIES	REQUIRED INPUTS	REQUIRED OUTPUTS	TARGET DATE	STATUS	NOTES
H-01	WTP outage / LOTO interface	Contractor / GYSBI Operations	Approved outage, permits, zero-energy confirmation	Safe isolated line and controlled return to service	Per outage	Open	Critical one-line-at-a-time sequence
H-02	Owner-supplied media	Contractor / GYSBI Procurement / Operations	Delivered media and staging access	Joint verified inventory available before removal	Pre-outage	Open	Loading accepted by bed depth/volume
H-03	Site QHSSE / PTW administration	Contractor / GYSBI QHSSE	Approved Method/JSA/ITP; personnel competency	Authorized, controlled work and records	Pre-mob / daily	Open	Performing Authority required
H-04	Waste, pipework reinstatement and commissioning	Contractor / GYSBI Operations	Staging/disposal instructions; access approval; witness points	Restored piping, accepted line, waste records	Per line / closeout	Open	Coordinate before second-line outage

Appendix I – Risk & Issue Register (Scope-related Extract)

Scope-specific risks and issues to be carried into the project Risk & Issue Register and reviewed during execution.

REF. NO.	RISK / ISSUE	CATEGORY	IMPACT	MITIGATION / ACTION	OWNER	STATUS
I-01	Loss of WTP redundancy / extended outage	Risk	Operational availability / schedule	Enforce one-line-at-a-time sequence; HP-8 acceptance before second outage	GYSBI / Contractor	Open
I-02	Media shortage or incorrect product/quantity	Risk	Quality / schedule	Joint inventory before first vessel; no removal until sufficient media confirmed	GYSBI / Contractor	Open
I-03	Restricted access and drain/header congestion	Risk	HSE / productivity / damage	Mandatory site verification; controlled hose/handling routes; minimum pipe removal	Contractor	Open
I-04	Dust / activated-carbon atmosphere hazards	Risk	HSE	Vacuum collection, ventilation, PPE, no dry sweeping, no wet-carbon vessel entry	Contractor	Open
I-05	Strainer/lateral damage or hidden defects	Risk	Quality / schedule / cost	Protected removal/loading; inspect after removal; hold point and GYSBI disposition	Contractor / GYSBI	Open
I-06	Leakage or contamination after reinstatement	Risk	Quality / availability	New compatible gaskets, correct supports/alignment, leak test, controlled commissioning	Contractor	Open

Appendix J – Handover & Acceptance Checklist

Project-specific checklist of the evidence required before each line return to service and final acceptance.

REF. NO.	HANDOVER REQUIREMENT	REQUIRED EVIDENCE	RESPONSIBLE PARTY	ACCEPTANCE AUTHORITY	STATUS	NOTES
J-01	Pre-mobilization submittals approved	Approved Method Statement, JSA/HSE, LOTO plan, ITP, schedule and equipment data	Contractor	GYSBI		HP-1
J-02	Replacement-media inventory verified	Joint inventory record against specified media requirements	GYSBI / Contractor	GYSBI		HP-2
J-03	Line isolation and operating redundancy confirmed	LOTO/isolation release; remaining line available	GYSBI / Contractor	GYSBI Operations		HP-3
J-04	Vessel cleaning / inspection complete	Per-vessel inspection sheets and photographs; defects dispositioned	Contractor	GYSBI		HP-4
J-05	Media layers verified	Per-vessel gravel and final media depth/volume/freeboard records	Contractor	GYSBI / Contractor Rep.		HP-5 / HP-6
J-06	Reassembly and pipework leak test complete	Gasket/connection checks and reinstated-header leak-test record	Contractor	GYSBI / Contractor Rep.		HP-7
J-07	First WTP line commissioned and accepted	Backwash/rinse, leak-free functional test and GYSBI acceptance	Contractor	GYSBI		HP-8 - required before second outage
J-08	Second WTP line commissioned; punch list closed	Commissioning records and final punch-list closure	Contractor	GYSBI		HP-9
J-09	Final handover complete	Daily reports, media records, inspection photos, waste records, test/commissioning records and closeout dossier	Contractor	GYSBI / PMO		Final acceptance

Appendix K – Bill of Quantities (BOQ)

Tenderer shall complete all unit rates and amounts. General Conditions shall not be hidden in work-item rates. Owner-supplied replacement filter media is excluded from material supply pricing. Unpriced items will be deemed included elsewhere unless expressly excluded and accepted by GYSBI in writing.

Ref.	Description	Unit	Qty	Unit Rate	Amount
BILL NO. 1 - PRELIMINARIES & GENERAL CONDITIONS					
1.1	Mobilization and demobilization, transport, site induction/access coordination, setup and removal of all contractor plant/equipment.	LS	1		
1.2	Project supervision/foreman, coordination, HSE/quality administration and daily progress reporting for complete works.	LS	1		
1.3	GYSBI QHSSE compliance: PTW/GOARC administration, JSA/toolbox talks, LOTO coordination, dust/respiratory controls, PPE, emergency arrangements and housekeeping.	LS	1		
1.4	Quality documentation: Method Statement, ITP, hold-point records, inspection sheets, media inventory/loading verification, photographs and closeout dossier.	LS	1		
1.5	Temporary protection, barricades, ventilation, lighting, access/work platforms, hose/cable management and equipment/floor protection.	LS	1		
1.6	Industrial vacuum removal system complete with suitable receivers, hoses, filtration/dust control, operators and power arrangements for both WTP lines.	LS	1		
1.7	Spent media containment, labeling, transport and disposal at an approved off-site location, including required waste transfer/disposal documentation. Including excess material stored adjacent to WTP facility (~20 additional tons).	LS	1		
1.8	Testing/commissioning instruments and support not otherwise included.	LS	1		
BILL NO. 2 - WTP LINE 1 FILTER MEDIA REPLACEMENT					
2.1	Coordinate isolation, LOTO, depressurization and drain-down of Line 1.	LS	1		
2.2	Temporarily remove/cut and reinstate obstructing drain/header pipework at last three filters, including fittings, unions/flanges, supports and leak test.	LS	1		
2.3	Vacuum remove spent media from sand filters, complete, to expose lower strainers for inspection.	Filter	3		
2.4	Clean and inspect sand filter vessels and strainers; photographic record.	Filter	3		
2.5	Reload Owner-supplied gravel and sand using approved protected-loading procedure; verify bed depths.	Filter	3		
2.6	Vacuum remove spent media from activated-carbon filters, complete, to expose lower strainers for inspection.	Filter	3		
2.7	Clean and inspect activated-carbon filter vessels and strainers; photographic record.	Filter	3		
2.8	Reload Owner-supplied gravel, Pyrolox/manganese media and activated carbon using approved protected-loading procedure; verify bed depths.	Filter	3		
2.9	Reassemble disturbed openings/connections; supply/install (new) replacement gaskets and seals.	LS	1		
2.10	Backwash, rinse, leak test, functional test and commission Line 1; submit records.	LS	1		
BILL NO. 3 - WTP LINE 2 FILTER MEDIA REPLACEMENT					
3.1	Coordinate isolation, LOTO, depressurization and drain-down of Line 2 after Line 1 acceptance.	LS	1		
3.2	Temporarily remove/cut and reinstate obstructing drain/header pipework at last three filters, including fittings, unions/flanges, supports and leak test.	LS	1		
3.3	Vacuum remove spent media from sand filters, complete, to expose lower strainers for inspection.	Filter	3		
3.4	Clean and inspect sand filter vessels and strainers; photographic record.	Filter	3		

Ref.	Description	Unit	Qty	Unit Rate	Amount
3.5	Reload Owner-supplied gravel and sand using approved protected-loading procedure; verify bed depths.	Filter	3		
3.6	Vacuum remove spent media from activated-carbon filters, complete, to expose lower strainers for inspection.	Filter	3		
3.7	Clean and inspect activated-carbon filter vessels and strainers; photographic record.	Filter	3		
3.8	Reload Owner-supplied gravel, Pyrolox/manganese media and activated carbon using approved protected-loading procedure; verify bed depths.	Filter	3		
3.9	Reassemble disturbed openings/connections; supply/install (new) replacement gaskets and seals.	LS	1		
3.10	Backwash, rinse, leak test, functional test and commission Line 2; submit records.	LS	1		
BILL NO. 4 - PROVISIONAL / UNIT-RATE ITEMS					
4.1	Repair existing internal strainer/lateral assembly where feasible, including labor and minor materials - only when directed.	Hour	TBD		
4.2	Supply and replace complete internal strainer/lateral component - labor only, excluding component cost unless separately quoted.	Each	TBD		
4.3	Additional existing drain/header piping replacement beyond base-access section.	m	TBD		
4.4	Additional industrial vacuum operation for abnormal deposits/foreign material beyond base scope.	Hour	TBD		

K.1 Grand Summary

Pricing Summary	Amount
Bill No. 1 - Preliminaries & General Conditions	
Bill No. 2 - WTP Line 1 Filter Media Replacement	
Bill No. 3 - WTP Line 2 Filter Media Replacement	
Base Tender Subtotal	
Bill No. 4 - Provisional / Unit-Rate Allowance (if instructed)	
TOTAL TENDER PRICE	

Pricing note: Bill No. 4 items shall be executed only when specifically instructed and commercially authorized by GYSBI. Quantities shown as TBD are measured/provisional quantities to be confirmed if the work is instructed.

Appendix L – GYSBI-Supplied Filter Media

GYSBI will provide the following replacement filter media for the work. The quantities shown represent the combined material quantities allocated to this project.

MATERIAL	QUANTITY	UNIT
Filter sand 0.8-1.2 mm (2-ton Super Sack / 4,000 lb)	5	sacks
Filter gravel (1.5-ton Super Sack)	6	sacks
Filter carbon 8 x 30 (0.5 ft³ bag)	400	bags
Filter Pyrolox (manganese ore) 20 x 40 (1 ft³ bag)	48	bags

Note: Media loading and acceptance shall remain governed by the specified bed depth/volume requirements in Section 3.2 and Appendix C. The Contractor shall jointly verify the delivered inventory with GYSBI before media removal begins.

Appendix M – Photographic Reference

The following photographs show representative existing conditions within the containerized WTP filter systems. The Contractor shall field-verify dimensions, access, piping interference and other site conditions before execution.

Photo M-01 - Typical lower vessel connection with foreground drain/header piping.

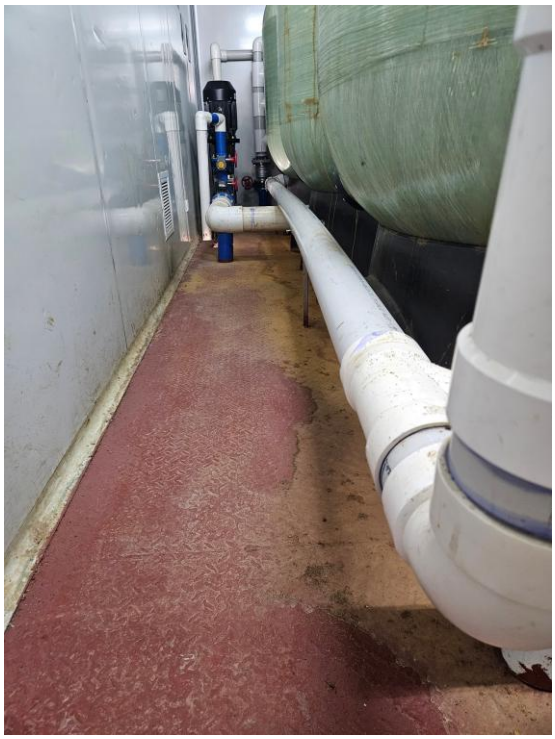

Photo M-02 - Container aisle showing restricted access between vessels and piping.

Photo M-03 - Valve and piping arrangement at the end of the filter line.

Photo M-04 - Typical lower vessel connection and support arrangement.

Photo M-05 - Close view of a lower vessel connection/opening.

Photo M-06 - Upper vessel connection and top piping arrangement.

Photo M-07 - General view of pressure vessels and upper piping within the container.