Government of Sindh, Pakistan
Irrigation Department

Sindh Barrages Improvement Project -
Guddu Barrage Rehabilitation and Modernization

Environmental and Social Management Plan
SBIP/G2: Removal of Silt Excluder at Guddu Barrage

February 2026

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Revision	Date	Originator	Reviewer	Issue, Modification	Approval
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B	26th Jan 2026	CSC & PMO	World Bank	Comments given and modification proposed.	Not approved
C	19th Feb 2026	CSC & PMO	World Bank	-	Approved on??????

List of Acronyms

BCM	Billion Cubic Meter	NEQS	National Environmental Quality Standards
BDL	Below Detectable Limit	OHS	Occupational Health and Safety Specialist
CEAP	Construction Environmental Action Plan	PAK EPA	Pakistan Environmental Protection Agency
CSC	Construction Supervision Consultant	PCMU	Project Coordination and Management Unit
Cumec	Cubic meters per second (m^3/s)	PMO	Project Management Office
Cusec	Cubic feet per second (cf/s)	POE	Panel of Experts
ECP	Environmental code of Practice	PPE	Personal Protective Equipment
EHS	Environmental Health and Safety	RAMSAR	Convention on Wetlands Signed in Ramsar Iran
EIA	Environmental Impact Assessment	RAP	Resettlement Action Plan
EMP	Environmental Management Plan	RCC	Reinforced Cement Concrete
ESA	Environmental and Social Assessment	RPF	Resettlement Policy Framework
ESIA	Environmental and Social Impact Assessment	SAP	Social Action Plan
ESMP	Environmental and Social Management Plan	SBIP	Sindh Barrages Improvement Project
GoS	Government of Sindh	SEPA	Sindh Environmental Protection Act
IEE	Initial Environmental Examination	Sindh-EPA	Sindh Environmental Protection Agency
GRC	Grievance Redress Committee	SID	Sindh Irrigation Department
GRM	Grievance Redress Mechanism	SIDA	Sindh Irrigation and Drainage Authority
MEC	Monitoring and Evaluation Consultant	SMF	Social Management Framework
MCM	Million Cubic Meters	WBG	World Bank Group
		WWF	World Wide Fund for Nature

Conversions

British Units	Metric Units	Metric Units	British Units
1 ft	0.305 m	1 m	3.28 ft
1 mile	1.609 km	1 km	0.621 miles
1 cusec (cf/s)	0.283 cumec (m^3/s)	1 cumec (m^3/s)	35.315 cusec (cf/s)
1 ac	0.405 Ha	1 ha	2.47 ac
1 MAF	1.2335 BCM	1 BCM	0.8107 MAF

Site-Specific Environmental and Social Management Plan (SS-ESMP)
SBIP/G2 – Removal of Silt Excluder at Guddu Barrage

Executive Summary

Introduction and Purpose: This Site-Specific Environmental and Social Management Plan (SS-ESMP) has been prepared for the Variation Order (VO-18) under Contract G2 of the Sindh Barrages Improvement Project (SBIP). The variation introduces new works involving the removal of the non-functional silt excluder in the left pocket of Guddu Barrage, construction of a temporary cofferdam, and provision of temporary water supplies to the Ghotki Feeder Canal during an extended annual closure period.

The SS-ESMP ensures that these works, critical for safe replacement of left pocket gates and long-term operability of the barrage, are undertaken in accordance with the environmental and social management principles established in the 2014 Environmental and Social Assessment (ESA). The document outlines the risks associated with the extended barrage closure, construction activities inside the Indus River, and the temporary realignment of water supply channels, and provides a detailed framework for mitigation, monitoring, and stakeholder engagement.

Rationale for the Works: A detailed engineering review revealed that the existing reinforced concrete silt excluder, built in 2008, obstructs installation of bulkhead gates required for replacing the left pocket gates and for future Operations & Maintenance (O&M). The structure is filled with silt and no longer functional.

Three options were assessed including full removal, partial removal, or retention. Technical committees concluded that removal of the structure (full or partial) is essential for both immediate construction needs and long-term barrage maintenance. The proposed works must be carried out during an extended canal closure period. This closure, while necessary, risks affecting irrigation, industrial users, and drinking water supplies served by the Ghotki Feeder Canal, which has a command area of approximately 344,000 acres.

Description of Works: The Variation Order covers three key activities:

1. **Removal of Silt Excluder**
   - Removal of roof slab and partial/complete removal of walls.
   - Controlled demolition using expansive mortar and jackhammers, with strict structural monitoring to protect barrage integrity.
2. **Construction of Temporary Cofferdam**
   - Clayey-silt earth fill embankment upstream and downstream of left pocket.
   - Designed to withstand expected pond levels (~250 ft) and ensure safe dewatering of bays for civil and mechanical works.
3. **Temporary Water Supply & Road Diversion**
   - A temporary channel connecting Rainee Canal to Ghotki Feeder Canal to supply at least 2000 cusecs, as agreed with water users.
   - Temporary road diversion and protection of utility lines (gas pipelines, PTCL fiber, power lines).

The construction period is between March 15, 2026 and May 14, 2026, extending the annual closure by 30 days.

Key Environmental & Social Risks and Mitigations: The key environmental and social risks and impacts and their corresponding mitigation measure are summarized below:

This extension creates significant risk of disruption to irrigation, industrial operations, and drinking water demands served by the Ghotki Feeder Canal. To address this, a temporary supply channel between Rainee Canal and Ghotki Canal has been incorporated as the primary mitigation measure to maintain at least 1500 cusecs of flow, with a design capacity of 2000 cusecs at the cofferdam design level.

A major cluster of risks relates to construction activities in and around the Indus River. The temporary cofferdam poses inherent challenges, including structural stability risks, potential overtopping, and safety hazards for workers. These risks are mitigated by using clayey-silt material for cofferdam construction, conducting daily monitoring for seepage and deformation, enforcing emergency response drills, and coordinating closely with Barrage Authorities to maintain pond levels below design limits. Similarly, removal of the silt excluder introduces risks associated with demolition, such as vibration, worker injury, and structural impacts on adjacent barrage components. These are addressed through controlled demolition using expansive mortar, stringent supervision, safe work procedures, and continuous structural monitoring.

Environmental risks include dust, noise, emissions, management of borrow and disposal areas, and potential disturbance to Indus River ecology, particularly the Indus River Dolphin. The mitigation strategy integrates internationally aligned best practices, including dust suppression, regulated haulage, proper waste disposal, and deployment of Dolphin Exclusion Zones supported with acoustic deterrent devices (pingers). Excavation, hauling, and disposal activities are to be strictly monitored to limit sediment release, noise, and habitat disruption.

Social risks pertain to road diversion-related traffic disruptions, cultural conflicts in borrow areas, and SEA/SH concerns. These are mitigated through implementation of an updated Traffic Management Plan, clear signage, community consultations, protection of utility corridors, and strict adherence to Codes of Conduct for workers. Although SEA/SH risk is low, proactive measures such as awareness sessions, anonymous reporting mechanisms, and gender-sensitive grievance processes have been incorporated.

Occupational health and safety risks represent another critical category. Workers face hazards related to working on water, heavy equipment operations, hazardous substances, and limited access within the cofferdam. Mitigation includes a comprehensive Job Hazard Analysis, updated Health & Safety Plan, mandatory PPE, daily toolbox talks, site inductions, rescue equipment availability, and regular third-party audits.

As a overall part of the project, ECPs have been developed providing guidelines for E&S management during construction as a best practices to be followed by the contractor.

Institutional Arrangements: Implementation of the ESMP is supported by a coordinated institutional structure designed to ensure accountability, compliance, and effective supervision. The Project Management Office of the Sindh Barrages Improvement Project (PMO–SBIP) holds overall responsibility for oversight and reporting, including submission of required environmental and social documentation to the World Bank. Day-to-day implementation of mitigation measures rests with the Contractor, who must update and apply the Construction Environmental and Social Management Plan (CESMP) and Health and Safety Plan (HSP) in accordance with the project's requirements. The Construction Supervision Consultant (CSC) shall review the CESMP and HSP and accept the documents accordingly. The CSC also plays a central supervisory role, providing

continuous on-site monitoring, compliance checks, and technical guidance to ensure adherence to ESMP provisions. Specialized personnel, including environmental coordinators, social safeguard officers, ecologists, and health and safety staff, support these functions by overseeing thematic aspects of environmental protection, community engagement, and worker safety. Collectively, these institutional arrangements embed environmental and social commitments into contractual obligations, payment milestones, and routine monitoring processes, thereby ensuring structured and accountable project delivery, as far as scope under VO-18 is concerned.

Monitoring and Reporting: A comprehensive monitoring regime has been established to track the implementation and effectiveness of environmental and social mitigation measures throughout the works. This monitoring framework covers ecological parameters such as potential impacts on dolphins and turtles; environmental quality parameters including dust, smoke, air emissions, noise, and vibration; and compliance issues related to waste disposal, spill control, and labour management. Traffic safety along diversion routes and water quality for workers and local users are also regularly assessed. Reporting is structured to ensure transparency and timely corrective action: the contractor submits monthly Environment, Social, Health and Safety (ESHS) performance reports, while the PMO prepares quarterly ESMP compliance reports for higher-level review.

Stakeholder Engagement and Disclosure: Stakeholder engagement has been an integral component of the SS-ESMP process, with consultations carried out across all relevant institutions, user groups, and affected communities. Meetings with SIDA and the Ghotki Area Water Board focused on the needs of water users and the operational implications of temporary supply arrangements. Local communities along diversion routes provided feedback on traffic impacts, safety concerns, and access considerations. Engagement with NHA, Sui Gas, PTCL, and SEPCO ensured that protection measures for road infrastructure, gas pipelines, fibre-optic cables, and power lines were incorporated into the project design. District administrations also contributed guidance on managing traffic flows and community interactions. Insights gathered through these consultations have directly informed engineering designs and mitigation measures, particularly concerning temporary water supply requirements and infrastructure protection. To maintain transparency, the SS-ESMP will be publicly disclosed on the Sindh Irrigation Department website and made accessible in local libraries, ensuring communities and stakeholders can easily review project commitments.

Conclusion: The temporary cofferdam and the removal of the silt excluder are essential interventions for completing the SBIP/G2 rehabilitation works and for strengthening long-term flood safety, irrigation reliability, and operational capacity at the Guddu Barrage. Although these works introduce notable environmental and social risks, particularly given the extended closure period and in-river construction, the ESMP provides a comprehensive mitigation framework that keeps these impacts controlled, temporary, and manageable. With robust monitoring systems, structured institutional responsibilities, and sustained stakeholder engagement, the project is well positioned to implement the Variation Order safely and responsibly. Overall, the SS-ESMP establishes a strong foundation for ensuring that the works proceed efficiently while safeguarding communities, workers, and the broader Indus River ecosystem.

1 Introduction

1.1 Background

The Sindh Barrages Improvement Project (the Project) is an ongoing proposed project, by the Government of Sindh (GoS), for rehabilitation of the fifty-year-old Guddu barrage to enhance its useful life to safeguard the reliable supply of irrigation water to about 1.05 million ha.

The Project has two key interventions: (a) replacement of barrage gates and canal head regulators, and some structural repairs to enhance the life of the barrage; and (b) strengthening and extension of river training works for modification of river flows and for Improved flood protection.

Location. The project is located in the Kashmore district of Sindh province. Guddu barrage is located at longitude 69.71' E and latitude 27.42' N across the River Indus some 16 km from Kashmore, 130 km from Rahimyar Khan, 190 km from Sukkur, and 630 km from Karachi. The Barrage is accessible by paved road from all these cities.

Supplies. Via three off taking canals (Beghari Sindh Feeder and Desert Pat Feeder on right bank, and Ghotki Feeder on left bank), the barrage provides irrigation water to about 1.05 million ha of agriculture lands of Jacobabad, Larkana and Sukkur districts of Sindh and the Nasirabad district of Balochistan directly benefitting about 0.35 million farming households and about 3 million rural population living in these four districts. Figure 1.1 depicts the location and command area map of Guddu Barrage, and Figure 1.2 shows the layout of the barrage. The canals also provide water to several industries, WAPDA's Guddu thermal power plant and drinking water to several villages. The barrage is also an important transport link across the Indus. Two major gas pipelines from Sui Fields cross the barrage to link with Multan-Sukkur main gas pipeline. The barrage was commissioned in 1962 and has now seen over sixty years of active service.

Need for improvement of Guddu Barrage and Canals. The feasibility study of Guddu barrage has identified 60 percent corrosion of steel in all the barrage gates and canals' head regulator gates; some deterioration in the superstructure, and defects in lifting mechanism. A failure of gates would be catastrophic, affecting water supplies to all the irrigated areas supplied by the barrage.

Rehabilitation Works: The SBIP/G2 contract for the rehabilitation of Guddu Barrage commenced in July 2017 and the current completion date is March 2027. The scope of work was based on the Feasibility Study that was completed in 2014. This includes replacement of all the main barrage and pocket scour gates, together with their hoists, as well as undertaking inspection and civil repair work of the glacis of each of the bays. This work requires the bays to be dewatered. Five sets of bulkhead gates have been fabricated for the project which are installed against upstream and downstream guide frames to isolate and dewater the bays.

In the left pocket of the barrage, the following scope of works are required as shown in Figure 1.3:

- Replacement of three pocket scour gates, embedded parts and hoists;
- Replacement of the upstream navigation lock gate, embedded parts and hoists;
- Civil repair works of corresponding glacis of the above four bays;
- Refurbishment of the downstream navigation lock gate and refurbishment of embedded parts, and Replacement of hoists;
- Replacement of three upstream fish pass gates (one on the main weir side and two on the pocket side); and
- Replacement of two downstream fish pass gates.

Silt Excluder. There is an existing silt excluder which was constructed in the left pocket of Guddu Barrage as part of the Rainee Canal project implemented by WAPDA in 2008, comprising reinforced concrete barrels extending through main barrage bays 64 and 65 in front of Ghotki Feeder Canal. See Figures 1.3 to 1.5 which demonstrate the location and arrangement of the silt excluder. During the feasibility study for SBIP rehabilitation of Guddu Barrage in 2014, the silt excluder was found to be not functional with the barrels filled with silt.

Original Scope. Bulkhead gates have been fabricated for the main barrage gate replacement work as per the G2 contract. This allows each bay to be isolated and dewatered. It was originally intended that these bulkhead gates would be used for the replacement of all barrage gates and civil repair works, including left pocket gates.

Rationale for Updated Scope. During the implementation phase of the project, the Contractor undertook a detailed survey of the pocket area in 2019, including the level of top of the silt excluder. They identified that the silt excluder would be a constraint to the installation of the bulkhead gates to replace the left pocket gates. Following further review, it was confirmed that that fixing of the guide frames and operation of the bulkhead gates could only be accomplished by partial removal of the silt excluder. Furthermore, two of the sets of temporary bulkhead gates that have been fabricated under the G2 contract will be handed over to the Employer for future maintenance of the new barrage gates. Therefore, in order to undertake the G2 works and have the ability to undertake future O&M and repair, it has been agreed to construct a temporary cofferdam and remove the silt excluder.

Detailed reviews and extensive deliberations have been held regarding the way forward to complete the G2 scope of works. Various alternative options for temporary works and silt excluder have been assessed to ensure that the proposed option is appropriate and most feasible, taking all aspects into account.

1.2 The Environmental and Social Assessment (ESA) 2014

Original Environmental and Social Assessment of the Project. The ESA is based on field studies and data collected between 2011 and 2014 by the design consultant team engaged for the project. Consultants also prepared their report on 'Environmental and Social Impact Assessment (ESIA) of Guddu Barrage Rehabilitation Project', and SID's 'Social Management Framework' (SMF), both of which have been disclosed on SID website along with the ESA reports. In addition, SID engaged a team of independent consultants to review and validate design consultants reports and prepare an independent ESA report in accordance with the guidelines of World Bank.

The ESA adequately assessed all potential impacts associated with the implementation of Guddu rehabilitation and includes an Environmental and Social Management Plan (ESMP). This SS-ESMP is consistent with the operational policies of the World Bank as documented in the ESA 2014.

Dolphin Management Plan. The Indus River between Guddu and Sukkur barrages is the nationally designated Indus Dolphin Reserve for Indus River Dolphin and also a RAMSAR wetland of international importance. This part of the river contains a large population of dolphins. Impacts of construction activities on dolphins were assessed, and mitigation measures are proposed in the ESA 2014.

The ESA 2014 and corresponding ESMP remains applicable for all works undertaken under the G2 contract. The relevant controls from these documents, such as those related to working on water and the dolphin management plan, shall be followed. Refer to Chapter 4 for specific details of measures from existing ESA 2014 and CESMP / HSP that will be followed. Annexure B outlines the sub-plans of the existing Construction Environmental and Social Management Plan (CESMP).

1.3 Objectives of ESMP

This ESMP will be an addendum to the ESMP of the original Project (SBIP) and will be used as a tool by the project management authorities to manage the impacts associated with the proposed project activities.

Specific objectives of this SS-ESMP are:

- Ensure that the impact of extended canal closure is minimized and the works are undertaken with clear and transparent communication with all relevant stakeholders; and
- Ensure that the left pocket and silt excluder works are undertaken in line with the required Health and Safety and Environment and Social standards of the contract.

1.4 Scope of this SS-ESMP

This ESMP covers the environmental and social impacts and risks associated with implementing the three components of the VO-18 works:

(i) Removal of the existing silt excluder (top slab and walls) in the left pocket of Guddu Barrage;

(ii) Construction of temporary cofferdam to facilitate the above and the safe execution of Left Pocket Works; and

(iii) Provision of temporary water supplies to Ghotki Feeder Canal during the extended closure period and corresponding road diversion.

Detailed description of these items can be found in section 2.2.3.The regulatory framework, environmental and social baseline conditions in the project area, and impact assessment presented for the original scope of work in the ESA generally remain the same and are not repeated in this document.

Nevertheless, as 10 years have passed since the original ESA, updated consultations have been undertaken with SIDA and Ghotki Area Water Board to ascertain any key differences in the water users in the command area.

The Contractor has prepared a Method Statement for the works. The existing Contractor's CESMP and Health & Safety Plan (HSP) will be revised to align with specific aspects for these works. The updated documents will be fully aligned with this SS-ESMP, and will be submitted for the approval of the Construction Supervision Consultant (CSC).

The required control measures from the original ESA and in this SS-ESMP are detailed in Chapter 4 and shall both be followed.

1.5 Inclusion of ESMP in Contract Documents

The Contractor has relevant experience in barrage construction and rehabilitation works with the use of cofferdams having carried out such works at Jinnah Barrage and Khanki Barrage. They are considered to have the relevant experience to undertake the works and mitigation measures. The Contractor has an existing CESMP and HSP and compliance is monitored via ESHS checklists and reports.

The Variation Order 18 for these works includes the following key aspects related to ESHS:

- Stipulation of the construction program.
- Stipulation of the extended canal closure period.
- Design and costs for temporary supplies channel.
- Design for robust temporary cofferdam.

- Associated milestones required for the payment of the works (including provision of temporary suppliers to Ghotki Canal).

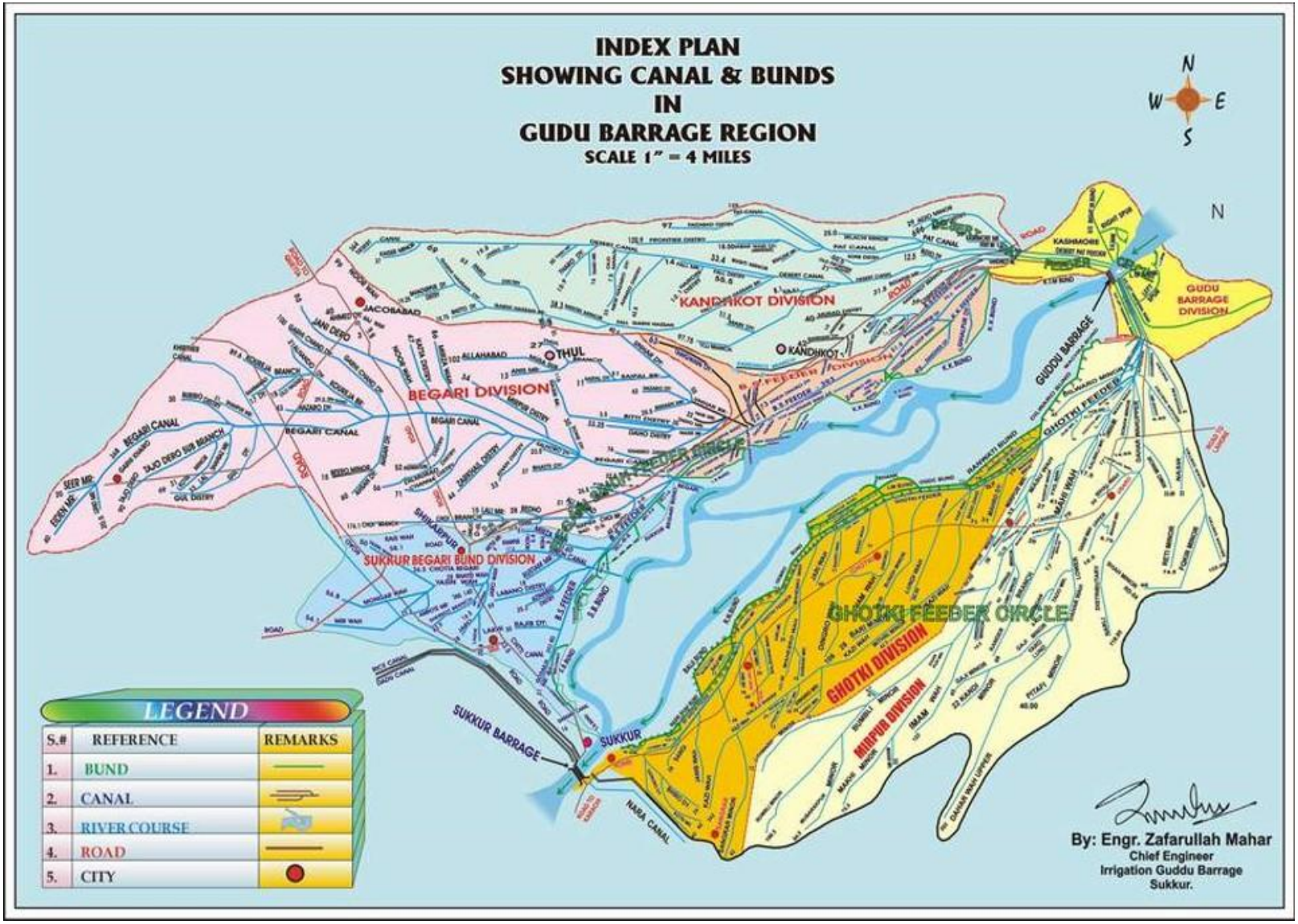


Figure 1.1: Location of Guddu Barrage and its command area (including Ghotki Canal)

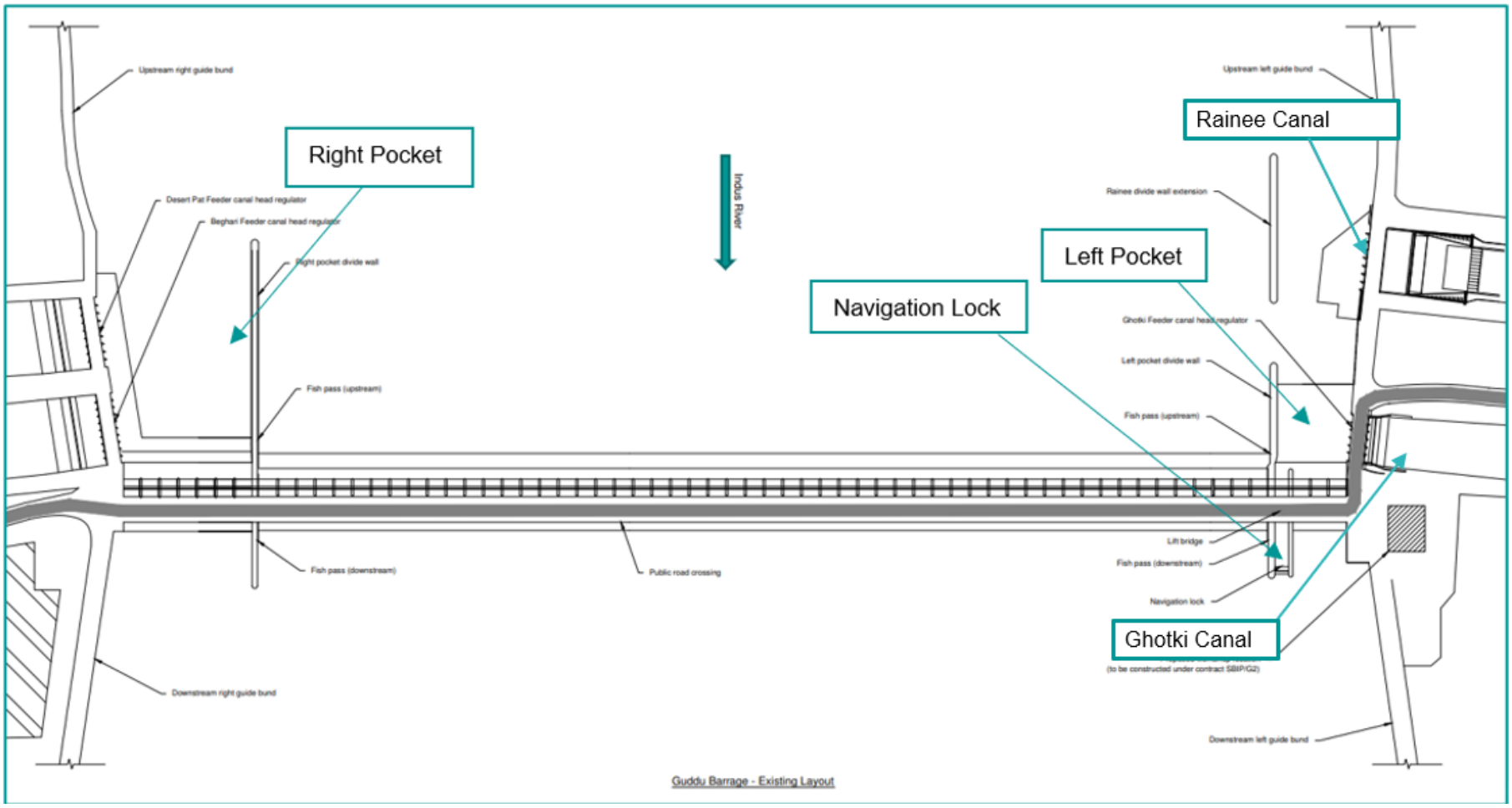


Figure 1.2: Layout of Guddu Barrage

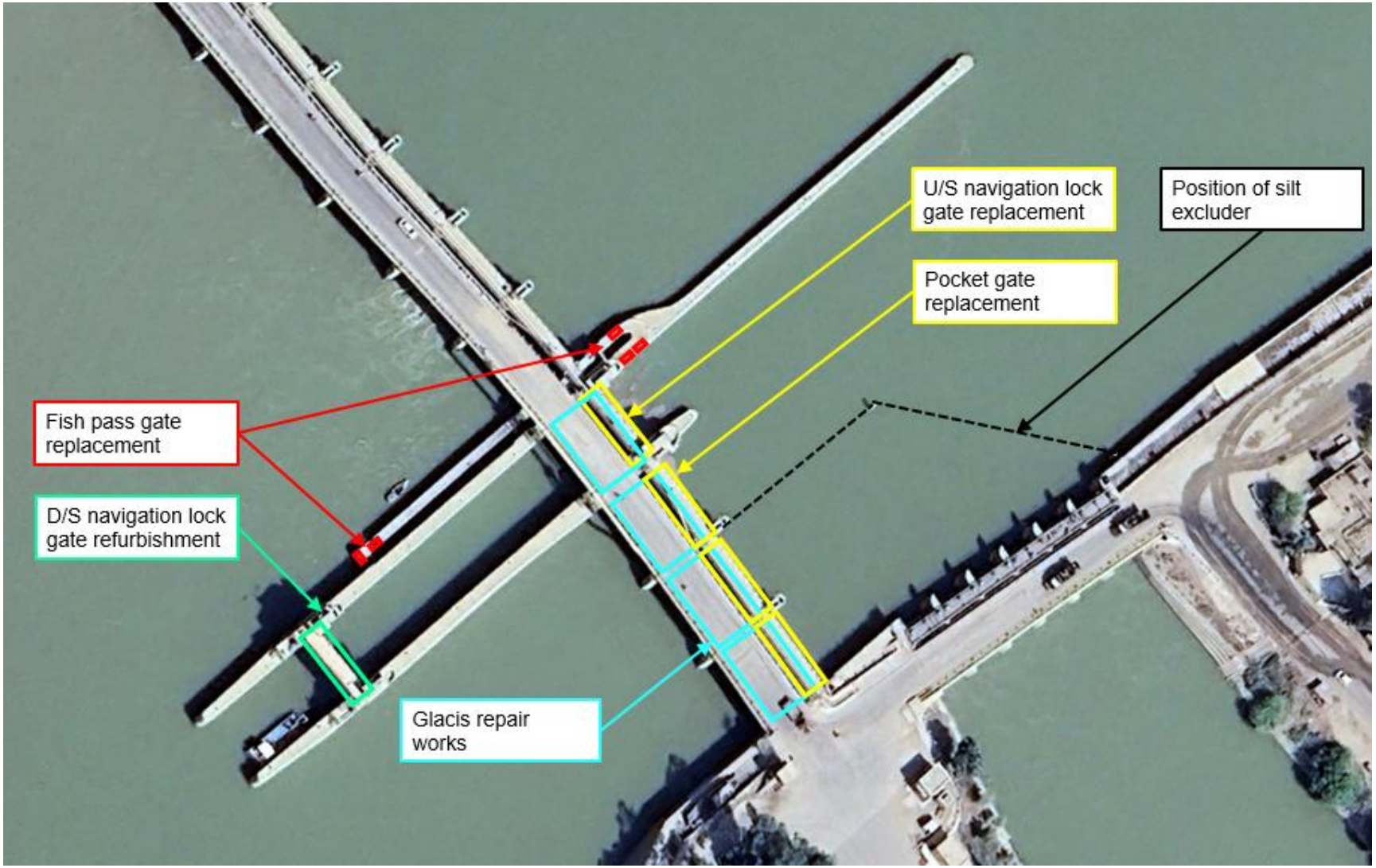


Figure 1.3: Location of left pocket scope of works and the existing silt excluder

Figure 1.4: General arrangement of the existing silt excluder (photographic views)

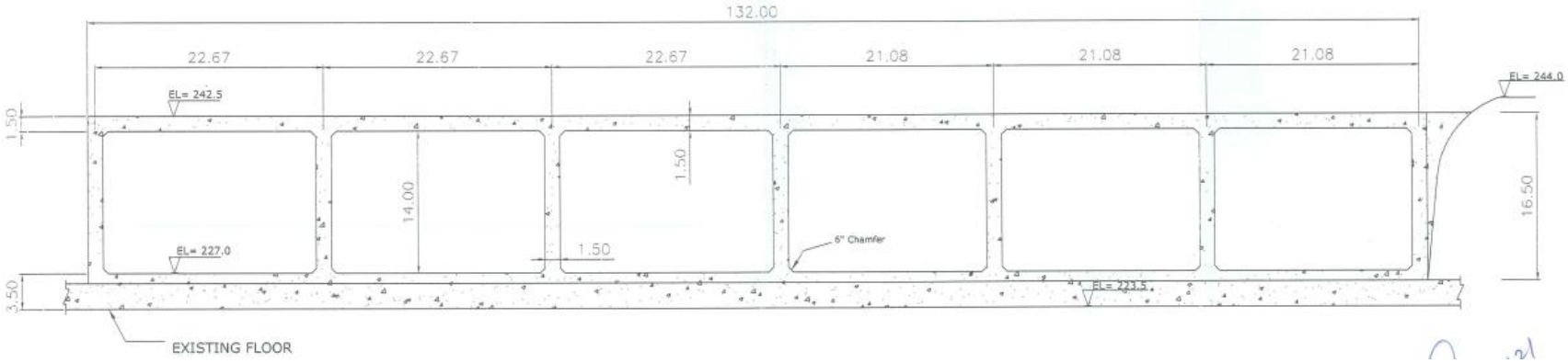


Figure 1.5: General arrangement of the existing silt excluder (as-built drawing extract)

2 Project Description

2.1 Baseline Conditions

2.1.1 Barrage area

The River Indus in Sindh is dominated by characteristics of the braided river (meandering channels, temporary shoals, and alluvial sand tracts), barrage pondage and floodplain agriculture. The river generally carries water through its entire width during the high-flow season of June to September, while the water will be limited to a few channels during the remaining months.

The barrage is situated in a rural area with no notable changes since the ESA. The road crossing the barrage continues to provide a key connection with the left and right banks of Sindh, with no further crossing until Sukkur city downstream. There are small fishing communities that live on the banks immediately downstream of the barrage, and farming communities nearby that utilize the roads, which are also utilized by the project.

2.1.2 Offtaking canals command area

BSF: As per the ESA 2014, Beghari Sindh is a non-perennial canal and the normal closure period of Beghari Sindh Feeder from October to May, hence extended canal closure period will not make a negative effect in the canal command area.

DPF: As per the ESA 2014, Desert Pat Feeder Canal is perennial canal and supplies water for Irrigation and for drinking purpose.

Ghotki: As per the ESA 2014, Ghotki Feeder Canal falls in the administrative limits of Ghotki and Sukkur Districts. Ghotki feeder canal is located in Talukas Ubauro, Daharki, Mirpur Mathelo and Ghotki of District Ghotki, and Taluka Pano Akil and Rohri of District Sukkur. Ghotki Feeder Canal off-takes from Guddu Barrage at left bank of Indus River with a design discharge of 8,490 ft^3/s. It feeds a command area of 344,014 acres.

Ghotki district has two gas fields namely Mari gas field and Qadirpur gas field in Daharki and Ghotki talukas respectively. A number of fertilizer and power industries rely on the gas provided at these gas field.

The project area is fertile land rich in growing cotton, wheat and sugarcane. The other crops in the area are rice, maize, barley, jawar, bajra, tobacco, gram and barley. The main occupation of the people is agriculture. As per the ESA 2014, the groundwater is found contaminated with sewerage in some areas. Common flooding in the area has resulted in the spread of malaria, typhoid and dengue within humans and diseases within livestock. Waterlogging is common adjacent to canals increasing the salinity of cultivated areas.

The maximum allocation as per the Water Accord (1991) is shown in Figure 2.1. Annexure C contains the actual flow records of Ghotki canal for the period of February to May from 2019 to 2024.

The current water users of Ghotki canal have been identified as:

- Farmers of Ghotki Area Water Board;
- Industrial users; and
- Drinking water supplies.

As outlined in 6.2, these water users have been consulted accordingly to understand the current demand during the period of the works.

GUDU BARRAGE (RABI)

10 days period		Allocation as per Accord	Begar Sindh Feeder	Desert Pat Feeder	Ghotki
March	1	4400	1860	2540	0
	2	4200	1680	2520	0
	3	4700	2480	2220	0

GUDU BARRAGE (KHARIF)

10 days period		Allocation as per Accord	Begar Sindh Feeder	Desert Pat Feeder	Ghotki
April	1	0	0	0	0
	2	200	61	55	84
	3	1400	546	91	763
May	1	3700	1609	767	1324
	2	6500			

Figure 2.1: Extract of the Water Apportionment Accord (1991)

Closure: There is an annual canal closure period throughout the month of April of each year, where the canals are closed and barrage gates fully opened.

Ghotki Canal Gates will be closed during the works. The required flows to Desert Pat Feeder can be maintained, despite the lower pond level, by increasing the gate openings.

As per the ESA 2014, as the growing season does not begin until June each year, the impact of extended closure on arable agriculture shall only be realized if the closure extends beyond May. However, the impact on industrial and drinking water supplies shall be considered.

2.1.3 Other areas related to the works

There are secondary areas that will be impacted by the silt excluder works, namely borrow areas and disposal areas, and the surrounding roads. These sites are within 16km of the barrage and fall into the same broad area as outlined in section 2.1.1.

2.2 Description of Proposed Silt Excluder Removal Works

2.2.1 General

The scope of the VO-18 works is:

- Removal of the existing silt excluder (top slab and walls) in the left pocket of Guddu Barrage;
- Construction of temporary cofferdam to facilitate the above and the safe execution of Left Pocket Works; and
- Provision of temporary water supplies to Ghotki Feeder Canal during the extended closure period and corresponding road diversion.

The general arrangement and design of these items is discussed in section 2.2.4.

2.2.2 Construction Program (Extended Closure Period)

The required program for the works outlined above has been assessed in detail to minimize where possible the extension to the closure period. For the development of the cofferdam program, the following points were considered:

- The work will be undertaken in both day and night shifts;
- There is limited access along the proposed cofferdam for dumper trucks to pass;
- Reasonable time has been allocated for dewatering and desilting;

- The programme allowed for the mechanical works (embedded parts, gate replacement, hoisting and testing) has been based on experience for the replacement of the 41 main barrage gates to date; and
- The Contractor will be able to work on the four bays in parallel, as well as on the fish pass gates and navigation lock gates works.

In order to construct the cofferdam and complete the various works in left pocket, an overall program of 90 days is required, as follows:

- 25 to 30 days for construction of upstream and downstream cofferdam;
- 5 days desilting and dewatering;
- 30 days for replacement of the embedded parts;
- 20 days for gate and hoisting replacement; and
- 10 days for cofferdam removal.

The partial or full removal of silt excluder works can be undertaken in parallel with the embedded parts and gate replacement works within the same 90-day program.

During the development of the scope of works, it was discussed and agreed that the time period for the works should be constrained to 60 days, unless appropriate supplies can be provided through pond level management and temporary supplies.

Within 60 days, only the civil repair works and embedded parts replacement can be undertaken. It is essential to remove the silt excluder at this time, either partially or fully, so that in 2027 the bulkhead gates can be installed to complete any gate replacement works that are not able to be carried out during the extended closure.

A key constraint is that the works must be completed on time by 15th May 2026 to ensure that the cofferdam is removed before flood season, and as the flow demands in the canal increase above the capacity of the temporary channel by mid-May.

The final agreed dates of extended closure period as per VO-18 are 15th March 2026 to 14th May 2026. This is an additional 30 days as compared to the annual closure period (starting 15 days earlier and finishing 15 days later).

The Variation Order for the works stipulates this requirement accordingly, stating that the works shall be undertaken from 15th March 2026 to 14th May 2026.

The program for the works is shown in the following Figure 2.2.

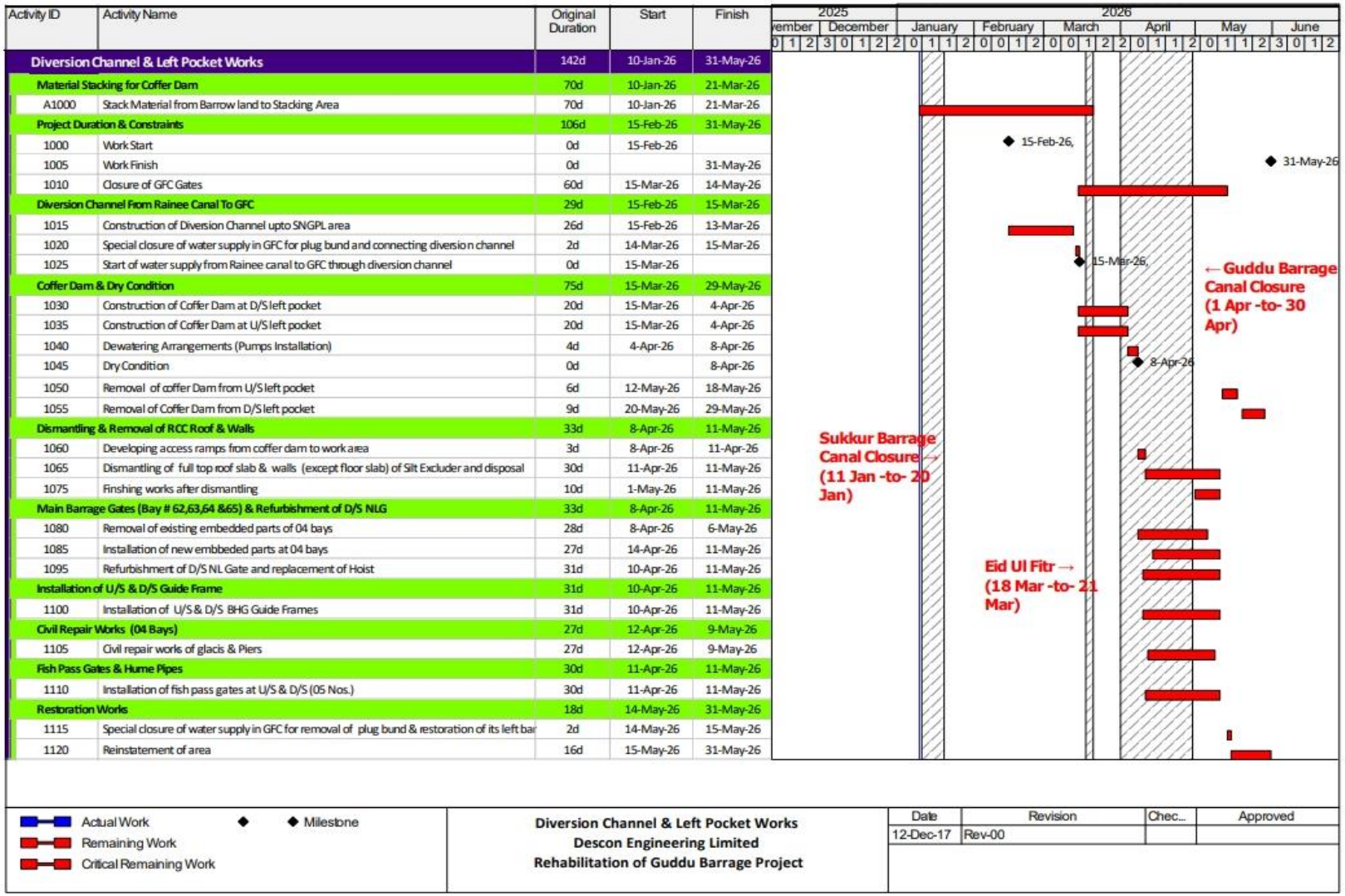


Figure 2.2: Contractor's proposed work schedule

2.2.3 Program Contingency Protocol

Any proposed change to these dates shall be discussed well in advance and consultations with the water users repeated accordingly for mutual agreement. Formal communication shall then be undertaken to communicate the agreed change. The contingency protocol is shown in Figure 2.3. The protocol covers three scenarios:

- A request is made for early start date;
- During the execution, the works are found to be delayed (20% behind the schedule); and
- Delays are not recovered, resulting in a delay to the end date.

The responsibility for notification of potential change of program is with CSC. Following receipt of the notification, PMO then will arrange the required meetings as outlined in the protocol.

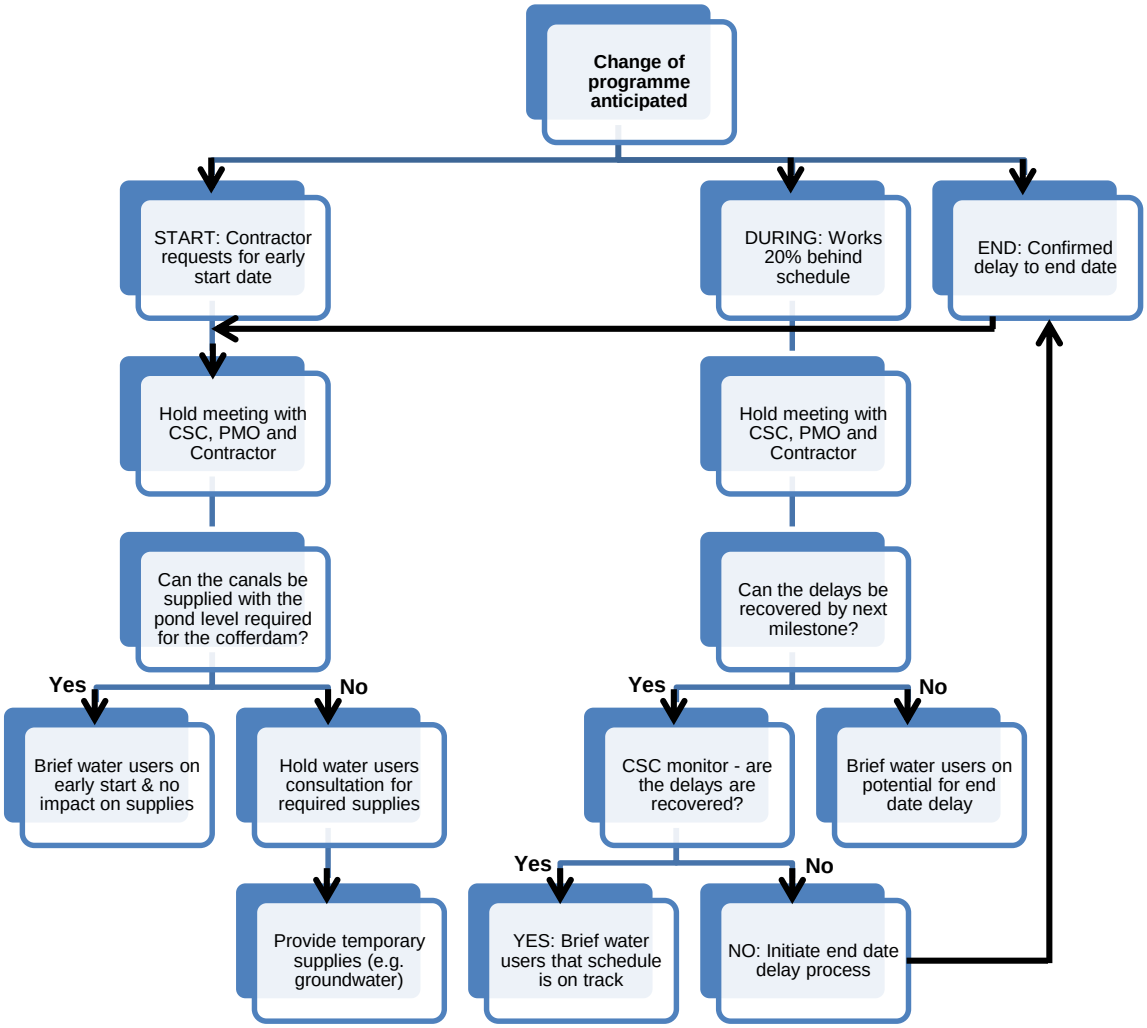


Figure 2.3: Program contingency protocol

2.2.4 Design

Removal of the existing silt excluder (top slab and walls). Detailed discussions have been held regarding the extent of silt excluder to be removed. It was agreed that leaving the bottom slab in place would be advisable for the safety of the existing barrage structure. Fully removing the structure (approximately 69,800 cft of concrete) avoids the risks associated with residual structure in place, however requires additional resources. A partial removal consisting of full removal of the top slab and removal of a 63ft length of the walls (approximately 47,500 cft of concrete) is required for the future deployment of bulkhead gates as well as O&M. An allowance has been included within the Variation Order for partial or full removal depending on final decision of the competent authority during the execution of the works.

Construction of temporary cofferdam. Various permutations of the cofferdam design were reviewed to ensure a robust but cost-effective arrangement. The location is shown in Figure 2.4. The final design comprises a clayey-silt earth fill cofferdam, with appropriate sides slopes and design pond level risk so the hydraulic gradient exits within the inner toe of the cofferdam, as shown in Figure 2.5.

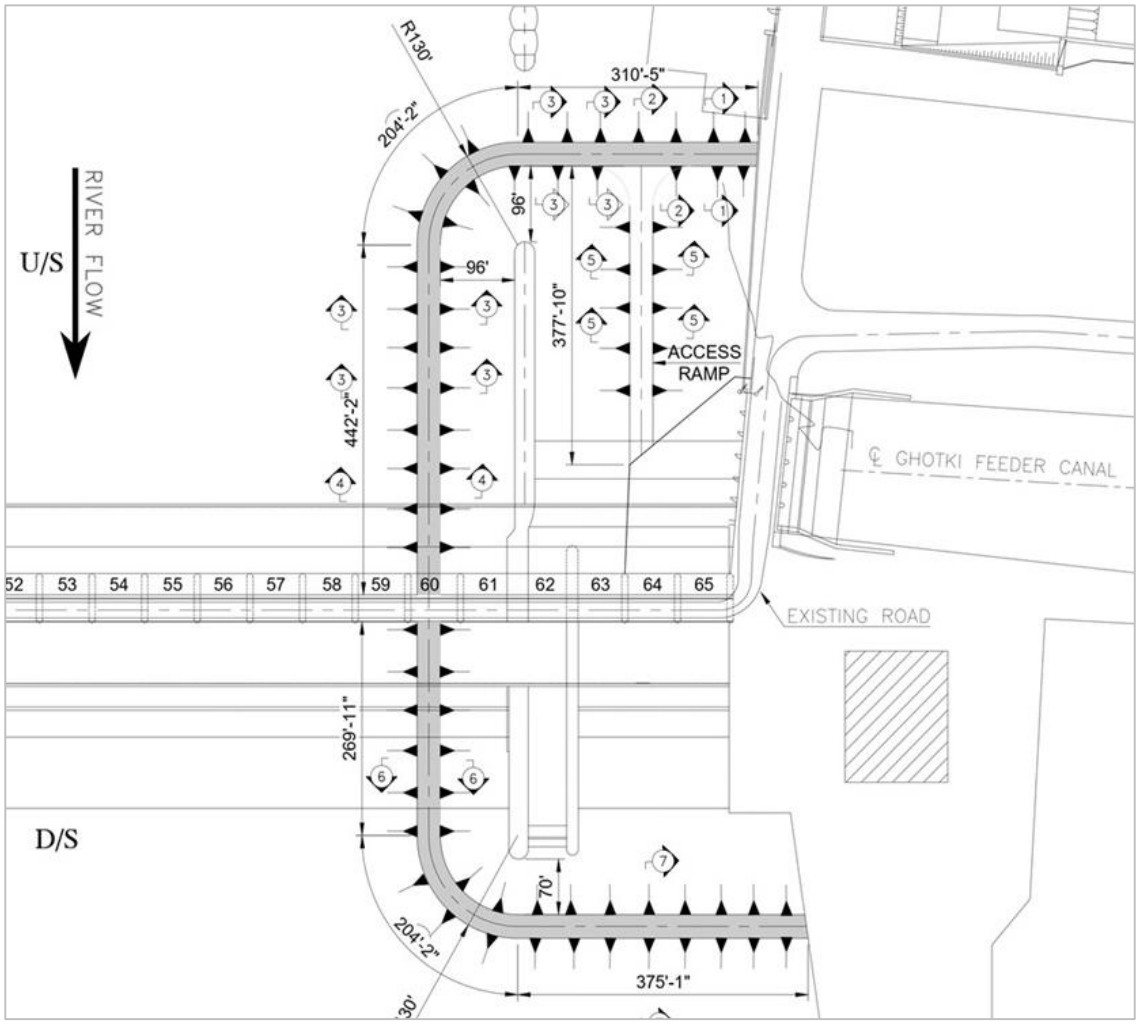


Figure 2.4: Location of temporary cofferdam in left pocket (upstream and downstream)

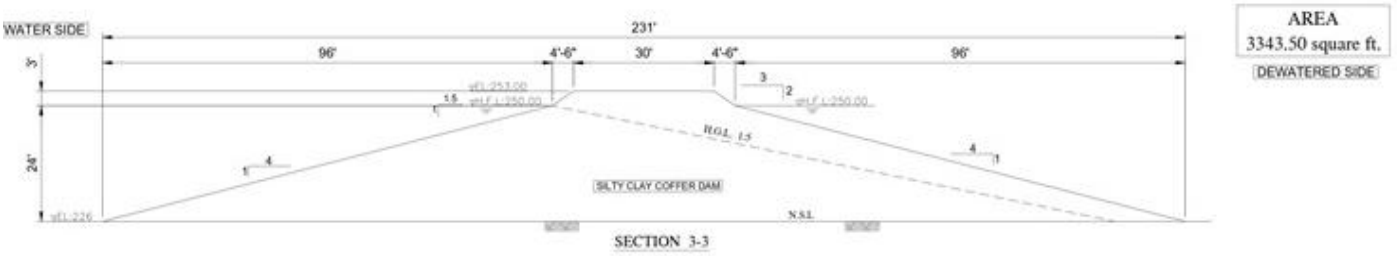


Figure 2.5: Cofferdam design cross-section (upstream)

Provision of temporary water supplies to Ghotki Feeder Canal during the extended closure period and corresponding road diversion. The agreed arrangement comprises a temporary channel between Rainee canal and Ghotki Feeder Canal, with a corresponding temporary road diversion. The arrangement is shown in the following figure. The channel is designed to supply 2000 cusecs at the cofferdam design level (pond level of 252'). The capacity has been designed based on consultations with water users and review of historical flow records. Figure 2.6 shows the arrangement for temporary road diversion.

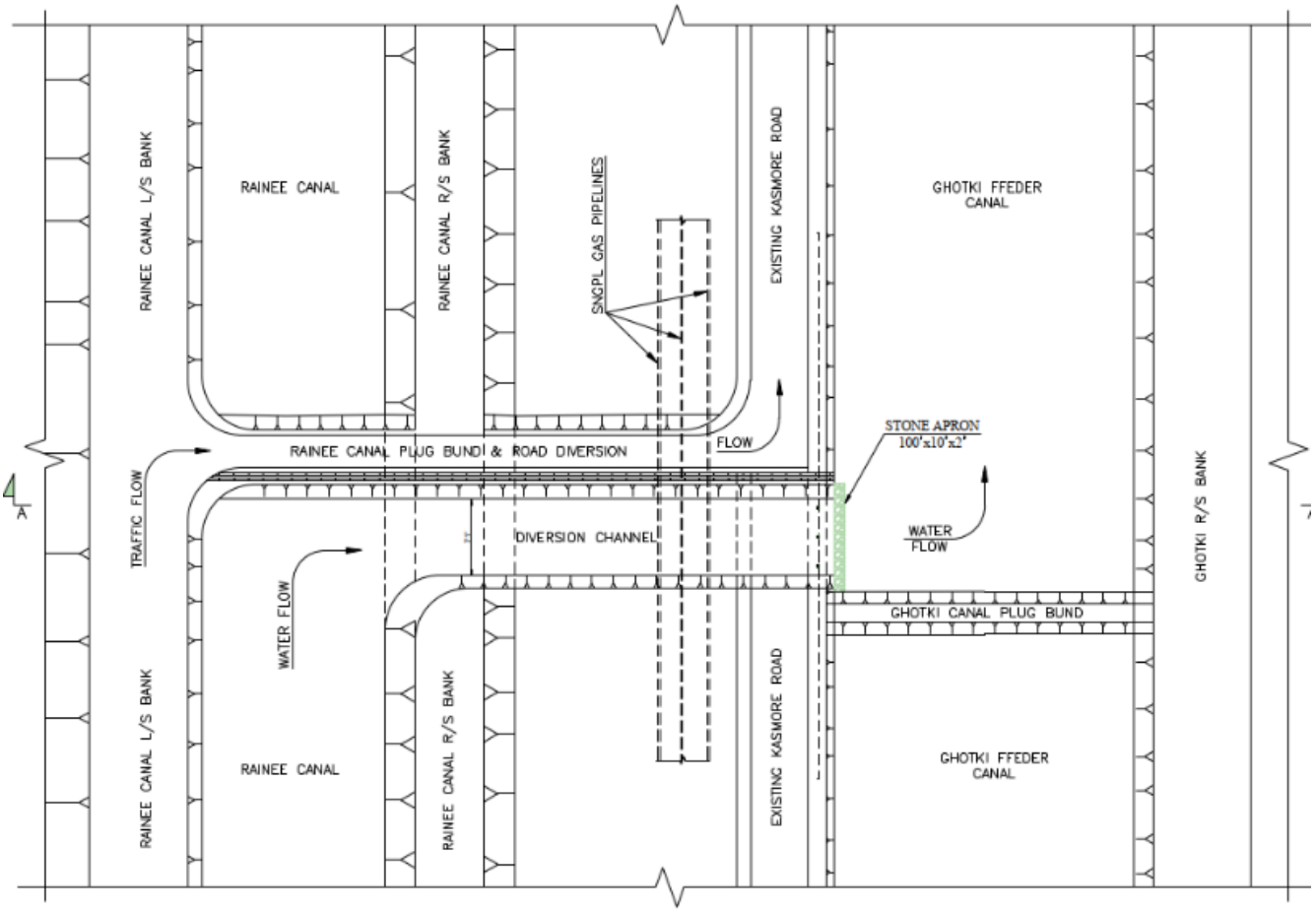


Figure 2.6: Arrangement for temporary road diversion and supplies to Ghotki canal from Rainee

2.2.5 Methodology

Removal of the existing silt excluder (top slab and walls). The roof slab will be cleaned from any silt and debris deposits. Holes will be drilled and filled with expansive mortar. After controlled cracking of the concrete, jackhammer will be used to detach it from the reinforcing bars. Rebar shall then be cut and removed. A detailed review has been undertaken of the Contractor's Method Statement to ensure the methods adopted are suitable and minimize risk of damage to the existing barrage structure. The break-out is zoned so only smaller equipment is used for the concrete closer to the apron and the piers.

During the works the cofferdam and barrage structure will be closely monitored by the Contractor against a surveillance plan agreed with PIC, PMO and the Barrage Authorities. The plan would include monitoring of the condition of the cofferdam and the barrage structure, as well as monitoring for movement and seepage (see section 4.5.5).

Construction of temporary cofferdam. The earthfill will be sourced from local borrow area, ensuring that the material is suitable for the cofferdam design. The material will be stockpiled in the Contractor's camp (which is adjacent to the specific work site on the left bank of the barrage). The cofferdam shall be constructed via placement of earthfill from a series of dumper trucks in sequence. The cofferdam will be progressively developed starting at the left bank. The access ramp will be constructed to provide a safe access route from cofferdam crest to dry floor level / work area. Access between upstream and downstream area will be undertaken through the open bays following removal of existing gates.

Provision of temporary water supplies to Ghotki Feeder Canal during the extended closure period and corresponding road diversion. The channel and accompanying embankment for road diversion shall be constructed in parallel, with the excavated quantity being utilized for the road diversion embankment. Localized plug bunds will be constructed in each canal as per Figure 2.6. The existing pipelines crossing the area shall be protected as per the requirements of the utility providers.

3 Alternatives

3.1 Alternatives to removal of silt excluder

As the silt excluder is not functional, a Technical Committee was constituted by the Irrigation Department in 2024 to review the possibility of removing it. The three primary options that were reviewed for the silt excluder are as follows:

1. Fully remove the silt excluder.
2. Partially remove the silt excluder.
3. Leave the silt excluder in place.

It was noted in the various meetings that the siltation of Ghotki Feeder Canal is an issue and this may be exacerbated by the blockage of the silt excluder barrels. The silt excluder must be removed in order for bulkhead gates to be deployed in the future for O&M. See Annexure D for the comparison of relative merits for these three options, which includes consideration of constructability, future operational safety and program.

3.2 Alternatives to temporary cofferdam

As the bulkhead gates cannot be used, an alternative method is required to isolate the upstream of the bays (in order to keep control of the pond level), dewater the area and undertake the embedded parts replacement and civil repair works.

Water level. The works are proposed to be undertaken during an extended annual canal closure period when the pond level and downstream water levels are lower. In recent years, the water level has been observed to be typically 1-3 ft above the level of the top slab of the silt excluder. Therefore, options for temporary works have considered a water level of 250' which can be available for a longer amount of time (if so, controlled by the Barrage Authorities), necessitating a minimum height of isolation method of 24ft plus freeboard.

Smaller plug bunds. Discussions were held about isolating and dewatering the pocket gates via the use of localized bunds to block the upstream entrances of the silt excluder barrels and isolate the working area for the three left pocket gates and navigation lock bay. Different access methods for these methods were discussed, including lifting the required equipment on the roof of the silt excluder. Concerns were raised, including the difficulty in forming the isolations, sealing and dewatering the working area, and the inability to isolate the required working area for the upstream navigation lock gate and embedded parts replacement. None of the above options were deemed viable, noting the above concerns.

Cofferdam options. For the cofferdam itself, it was reviewed if the divide wall could be excluded from the cofferdam (for a shorter cofferdam), resulting in it being dewatered on the inner side only. As the Barrage O&M manual stipulates that that head difference should be kept within 2ft, this option was discarded. The material of the cofferdam was evaluated in detail with respect to the hydraulic gradient and corresponding required width of cofferdam, concluding that clayey silt material is required rather than sandy material from the river bed. The option of utilizing sandbags filled with river sand was also reviewed. Due to the required location of the cofferdam, the bags could not be lowered from the barrage or left bank, and would require placing from pontoons. The time required to transport the bags on the pontoon back and forth between their temporary storage on the left bank would be greater than the proposed methodology of earthfill. They also noted that sheet piles would be required in this case, which would not be possible in the current alignment due to concrete floor and stone pitching.

3.3 Alternatives to extended closure period

As discussed in section 2.2.2, the program has been scrutinized to minimize the extended closure period.

3.4 Summary

A temporary cofferdam allows replacement of the three left pocket gates and upstream navigation lock gate, including their embedded parts and hoists, refurbishment of the downstream navigation lock gate and replacement of its hoist, various civil repair works, and replacement of the 5nr fish pass gates of left pocket in dry conditions. There are no other feasible temporary works methods identified to dewater the bays and undertake this work.

Detailed reviews have been undertaken of the Contractor's proposed works and the corresponding cost estimate and program.

Further, as per the Feasibility Study Report, the silt excluder is not functioning as intended. The cofferdam provides the opportunity to remove or partially remove the silt excluder with only limited additional cost and without repeating similar works and impacts to the surrounding communities at a later date.

Therefore, to ensure timely completion of the SBIP/G2 contract and for future O&M benefits, it has been agreed to proceed with the temporary cofferdam methodology for the left pocket G2 works, and to undertake removal of silt excluder during this time. The Irrigation Department will extend the canal closure period for 60 days with a temporary diversion channel to maintain supplies to Ghotki Feeder Canal.

4 Potential Impacts and Mitigation Measures

4.1 Key Impact: Disruption to Canal Supplies

The impact to canal supplies is the key risk associated with the VO-18, as the works will require an extended annual closure period and isolation of Ghotki Feeder Canal head regulator.

As outlined in the previous chapter, the canal is used by the farmers of the Ghotki Area Water Board and SIDA. In addition, there are a number of key industrial and drinking water users.

4.2 Other potential impacts

The potential risks for these works have been analyzed and risk level before mitigation measures has been assessed. Refer to Annexure E for the resulting risk summary table prior to mitigation measures.

Once mitigation measures have been applied, the risk level reduces accordingly. The resulting risk level is shown in the following Table.

Table 4.1: Risk Assessment (after mitigation measures)

Area	Specific risk item	Likelihood (after mitigation measures)	Consequence (after mitigation measures)	Resulting risk level
Disruption to Canal Supplies	Social impact from reduced provision of water	Low	Medium	Medium
General	Cultural conflicts / security	Low	Medium	Medium
	SEA/SH	Low	Low	Low
	Workers' health and safety (including working on water)	Low	Low	Low
Temporary road diversion	Traffic / pedestrian disruption	Medium	Medium	Medium
	Impact on utility crossings	Low	Medium	Medium
	Haulage related risks	Low	Medium	Medium
Cofferdam	Breach of cofferdam	Low	Low	Low
	Pollution of river	Low	Low	Low
	Impact on dolphins, turtles, and other aquatic fauna	Low	Low	Low
	Sediment dispersion risks from disposal activities	Medium	Low	Low
Silt excluder removal	Use of expansive compound	Low	Low	Low
	Use of demolition equipment (including jackhammers)	Low	Low	Low
Borrow and Disposal areas	Damage or destruction of vegetation and associated habitats	Low	Low	Low
	Increase of flooding risk if natural drainage is disrupted	Low	Low	Low
	Increase of dust and noise to nearby communities	Low	Low	Low

4.3 Key Mitigation Measures

The ESHS risks outlined in the prior section are broadly covered in the Contractor's existing CESMP and HSP, based on the ESA 2014.

The Contractor has prepared a Method Statement for the works and the CESMP and HSP will be revised to align with specific aspects for these works (such as the use of expansive mortar).

The following sub-sections outline the key ESHS impacts of the works. It notes where the impact is already covered by the existing contract provisions.

4.4 Disruption to Canal Supplies

The Irrigation Department has requested a temporary arrangement to ensure continuity of supplies to the canal, for which a number of options were evaluated. The agreed arrangement comprises a temporary channel between Rainee canal and Ghotki Feeder Canal, with a corresponding temporary road diversion.

Mitigation

Mitigation measures to minimize the impact on water users are as follows:

- Consultations undertaken with SIDA, Ghotki Area Water Board, NGO and key other water-users. Schedule and mitigation measures developed with consultee feedback considered;
- Construction of temporary supply channel to Ghotki Feeder Canal. A channel of 2000 cusecs shall be provided;
- SIDA and Ghotki Area Water Board to enact a water allocation governance process to ensure equity to all users, including those at the tail;
- Construction period to be stipulated in the VO, with importance of this requirement noted;
- Detailed work plan to be provided by the Contractor with some in-built contingency (including time and provision for additional plant/workers) for potential delays;
- Pond level to be kept to at least 250' to allow some minor supplies to be provided to the other canals (whilst not exceeding the design limit of the cofferdam);
- Communications given to water users well in advance of the works and during them; and
- CSC to closely monitor the progress of works and issue clear warnings for delays to ensure that the works will complete on time by 15th May 2026. Consideration shall be given for early start if there is no impact on the water users (i.e. appropriate supplies can be provided).

4.5 Other

4.5.1 Cultural conflicts and security

There are no communities that live directly adjacent to the left pocket.

The risk of cultural conflict and corresponding impact on security of the Contractor's workers is considered to be limited to (i) work in the borrow areas, (ii) haulage impacts on local roads, and (ii) road diversion. Items (ii) and (iii) are covered in the traffic management section.

Mitigation:

Mitigation measures to minimize the risk of conflict with local communities due to borrow areas are:

- Use experience from the previous SBIP/G3 project to inform the selection of borrow areas with considerations for security and access;
- Contractor CLO supported by PMO and PIC social experts to undertake consultations with communities adjacent to the new work areas during the works to maintain relations and capture any grievances; and
- *Follow requirements in CESMP for borrow area management, including land agreement, E&S screening, dust sprinkling, excavation safety, etc.*

4.5.2 SEA/SH

Existing workers of the Contractor shall be utilized for this works, reducing risks associated with influx of new laborer.

The SEA/SH risks are assessed to be low using the World Bank's SEA/SH risk assessment tool. The risk assessment is based on the country and legal context, gender norms and beliefs, and national capacity to respond. In addition, several project specific factors including project location, type of infrastructure, accessibility of women for consultations, poverty levels, accessibility for supervision of project and others have been considered for determining the risk levels. Though the SEA/SH risks are assessed as low, proactive measures will be undertaking to prevent SEA/SH.

Mitigation:

These mitigation measures proposed are as below:

- *Follow requirements in CESMP for mitigating SEA/SH risks, including:*
    - *Code of Conducts (CoCs) have already been developed and signed by all workers. This will be continued during implementation of VOs along with refresher trainings for all employees and workers;*
    - *Posting of CoCs in public spaces at Contractor's work sites, and village information centers and public places of adjoining/neighboring communities in the Urdu language;*
    - *Awareness to communities, particularly vulnerable groups including women and male and female children, to understand the risks of SEA and SH and the roles and responsibilities of parties involved in project implementation on SEA and SH prevention, processes for reporting incidents of project-related SEA/SH, and the corresponding accountability structures; and*
    - *The Contractor will continue to employ their skilled staff and apply unskilled construction labor from the local population as far as possible to minimize an influx of outsiders into the communities.*

4.5.3 Workers' health and safety

The Health and Safety risks for the Contractor's staff associated with the works include: working on water, working with hazardous substances (including expansive mortar), collision with vehicles and machinery, road traffic, excavation/disposal pile hazards, dust, and exposure to electrical hazards from the use of tools and machinery.

Mitigation:

The following mitigation measures will be implemented:

- Conduct a Job Hazard Analysis to identify potential hazards that may arise from the proposed works or working conditions for the project workers and safety hazards to the

public/ local community and implement necessary control measures. The job hazard analysis shall be part of the Contractor's Method Statement;

- Contractor will prepare and implement an updated version of the HSP. This shall contain general guidance for all identified hazards under each work activity, and site-specific HS hazards and risks during construction, and control and preventive Measures proposed by the Contractor. The HSP will be reviewed by the CSC and PMO and approved accordingly to ensure that it aligns with this SS-ESMP;
- The Contractor will prepare a Permit to Work system based on the Job Hazard Analysis and competency assessment for staff required for the activity;
- Regular site inspections by the CSC and PMO ESHS experts;
- Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on the working on water and cofferdam related risks, including use of rescue boat, life vests, ring buoys, and emergency response plan (including for cofferdam breach);
- Incident investigation and reporting, including a complete record of accidents and near misses, will be maintained;
- First aid facilities will be made available at the worksites;
- Contractors will have dedicated and qualified staff to ensure compliance with the HSP;
- Awareness-raising material will be used, including posters, signages, pamphlets, and others at the worksites; and
- *Follow requirements in CESMP and HSP for the associated risks.*

4.5.4 Temporary road diversion and haulage-related impacts

The temporary road diversion is necessary for the provision of temporary supplies, but will increase risk of traffic in the area. In addition, the haulage of materials from the borrow area and to the disposal area will increase traffic. It is noted that the additional traffic from these activities is considered relatively minimal noting the existing forms of traffic on the roads (including large trucks, slow farming plant, etc). Haulage routes pass by communities so road safety of public (including children) shall be considered.

Mitigation:

- Contractor will develop an updated Traffic Management Plan for the works and incorporate into their CESMP, that is in compliance with ECP 15 on Traffic Management. Plan to include:
    - Communication methods to disseminate diversion information in advance to the local community (including key stakeholders and services), including consultations, media releases, posting of information;
    - Complaint’s box and means to capture verbal complaints (register with flagmen);
    - Diversion signboards;
    - Flagmen;
    - Turning mirrors on the key corners of the diversion; and
    - Consideration of sensitive areas (e.g., school/community crossing points) on the relevant routes to the VO-18 works, and implementation of additional measures (such as consultations, speed calming measures);

- Undertake consultations with National Highways Authority and gain consent for the works and the corresponding traffic management plan;
- Contractor's CLO will conduct consultations with the local communities to discuss routes, reasons for the works, schedule, etc. Discussions will also cover the risks associated to safety of the children. Contractor will make sure the dissemination of information to concerned community is done well before start of each sub-activity at site; and
- *Follow requirements in CESMP and HSP for haulage, including dust sprinkling, restoring any damage, following of speed limits, avoiding small village roads, use of flagmen, speed calming measures (e.g., speed bumps), etc.*

Figure 4.1 outlines the proposed diversion plan for the works.

4.5.5 Cofferdam

The construction of cofferdam poses risks to the workers, and the cofferdam stability must be ensured during the works within it to avoid breach and corresponding risk of drowning.

The cofferdam design does not include sheet piling hence has relatively low risk to dolphins and other species.

Mitigation:

- Ensure that the works as compared to the design is implemented. This shall include measures such as:
    - CSC to review the design of cofferdam;
    - Undertaking soil testing to ensure that the earthfill is as per design;
    - Monitoring by CSC to ensure that the relevant level of compaction is being undertaken; and
    - Surveys to ensure that the required profile and levels are achieved.
- Ensure that a daily cofferdam monitoring plan is developed by the Contractor with regards to risk of breach. This will cover aspects such as:
    - Visual monitoring for any signs of deformation;
    - Leakage measurement and monitoring; and
    - Survey of crest level.

  Trigger levels for the findings from the above surveys will be well defined. The CSC Barrage Safety Specialist will review this monitoring plan in detail and ensure that all methods are appropriate. The plan will be jointly implemented by the Contractor with close daily supervision of CSC;
- Emergency response plan to be developed by the Contractor that specifies actions to be taken following any signs of risk of breach (as identified in the monitoring plan above). Plan to include rescue measures for rapid inundation, and shall include alarm process, evacuation routes, muster points, communication procedures, provision of divers at all times during the works for enacting the rescue procedures. The emergency response plan shall be added to the Contractor's HSP;
- Emergency drills to be undertaken for the above evacuation procedures. All visitors to be briefed on these requirements, as well as the Contractor's workers;

- Close liaison with the Barrage Authorities to ensure that the pond level is kept below the cofferdam design level;
- Ensure that the removal of the cofferdam is undertaken to avoid high concentrations of sediment in the river at one time. The BoQ for the works shall include an item for cofferdam removal accordingly. Cofferdam shall be fully removed with sediment flushing if required to ensure that there shall be no obstruction to barrage and canal flows after the works; and.
- *Follow requirements in CESMP and HSP for corresponding in-river works, including Dolphin Exclusion Zone and associated measures (including pingers on buoys and boats), pollution risk, ecological impact, working on water, emergency planning, etc.*

4.5.6 Silt excluder removal

The removal of the silt excluder requires careful planning and control to reduce health & safety risks to the personnel undertaking the demolition works. The specific steps associated with applying the expansive mortar and using demolition equipment have been defined in the Method Statement to reduce the risk of accident / injury.

Mitigation:

- The Method Statement for the works shall be developed by the Contractor and reviewed by CSC; acceptance to be granted prior to the work commencing;
- The storage, transport and storage of expansive compound shall be closely controlled as per the MSDS and manufacturer's guidance so as to minimize associated risks (pollution and safety). This will include pollution prevention measures such as defined bunded storage area of the expansive mortar, spill kits, MSDS sheets posted at site;
- A trial of the expansive compound shall be undertaken prior to the works commencing to ensure that specific quantities and methods utilised are appropriate;
- The use of demolition equipment (jackhammers, cutting tools) shall only be undertaken by trained workers;
- All staff and visitors who will enter the cofferdam area are to be given awareness briefing on the risks associated with being a bystander to these demolition works;
- Existing structure to be monitored as per plan jointly developed with the Contractor, CSC and the end user of the barrage; .
- Waste handling shall be controlled with strict prevention of dumping of mortar and concrete waste in the river. Locations for temporary storage to be clearly defined and controlled, together with transport routes to the disposal areas. Disposal plan shall be included in the Contractor's CESMP; and.
- *Follow requirements in CESMP and HSP for other relevant mitigation measures, including related to use of heavy plant / machinery, transportation of materials, etc.*

4.5.7 Borrow and disposal areas

Mitigation measures are required to reduce the risk of harm to local communities, vegetation and habitats within the vicinity of the borrow area and disposal areas.

Mitigation:

- Disposal of the silt excluder debris shall be in approved area within Irrigation Department Land;

- Borrow areas shall be pre-approved by CSC prior to their use. Screening criteria as used on the project shall be implemented, which includes landownership checks, no sensitive habitats, no drainage, reinstatement plan, no social issues (evidence by community consultations); and.
- *Follow requirements in CESMP for borrow area and disposal area management, including land agreement, E&S screening, dust sprinkling, excavation safety, etc.*

Figures 4.2 to 4.4 shows the location of the borrow area and associated haulage routes. ESHS screenings have been undertaken of these borrow areas to confirm that there are no key ESHS receptors at these areas. Consultations have been undertaken with communities in proximity to the borrow area and along the haulage route; see Chapter 6.

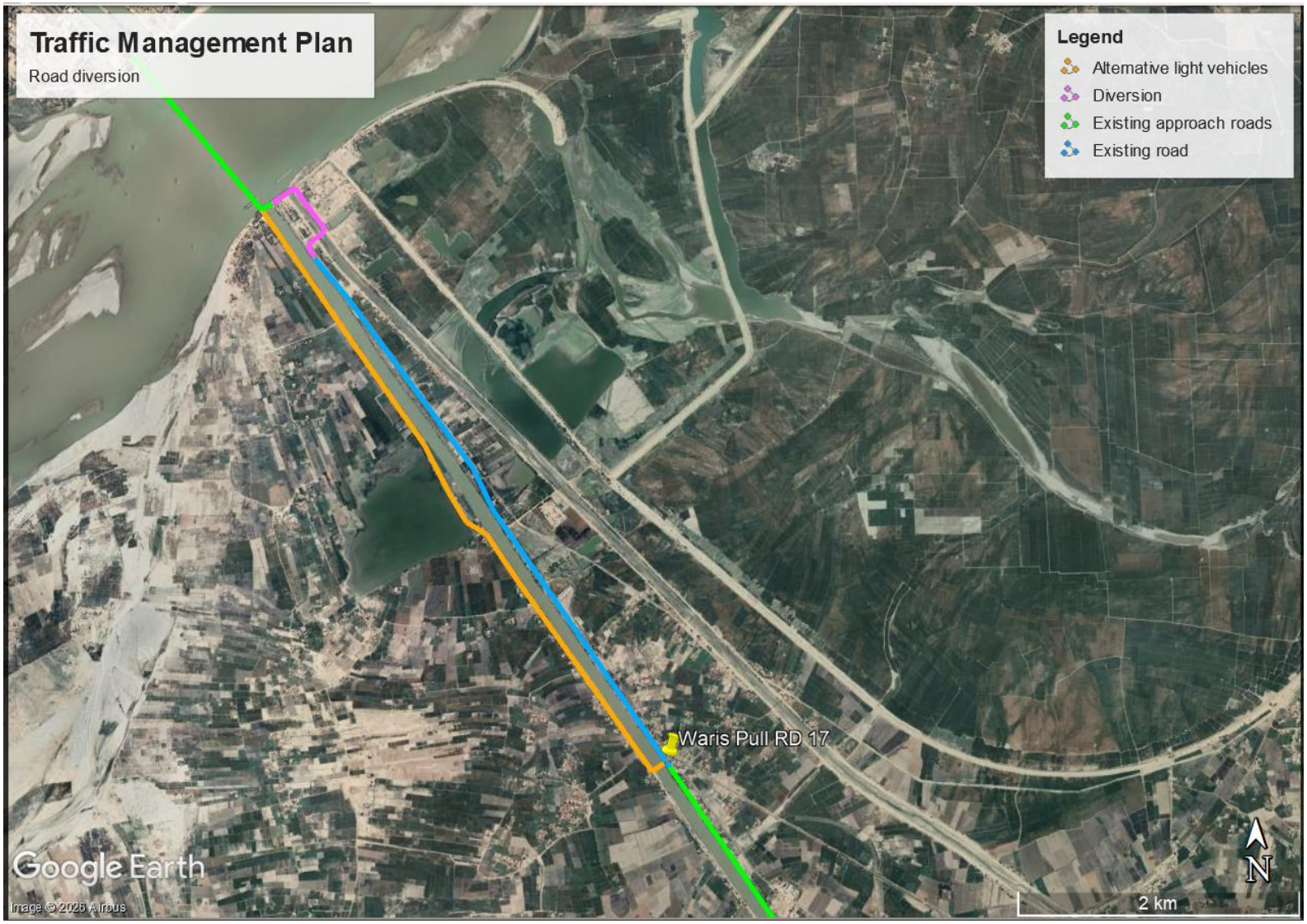


Figure 4.1: Map of road diversion

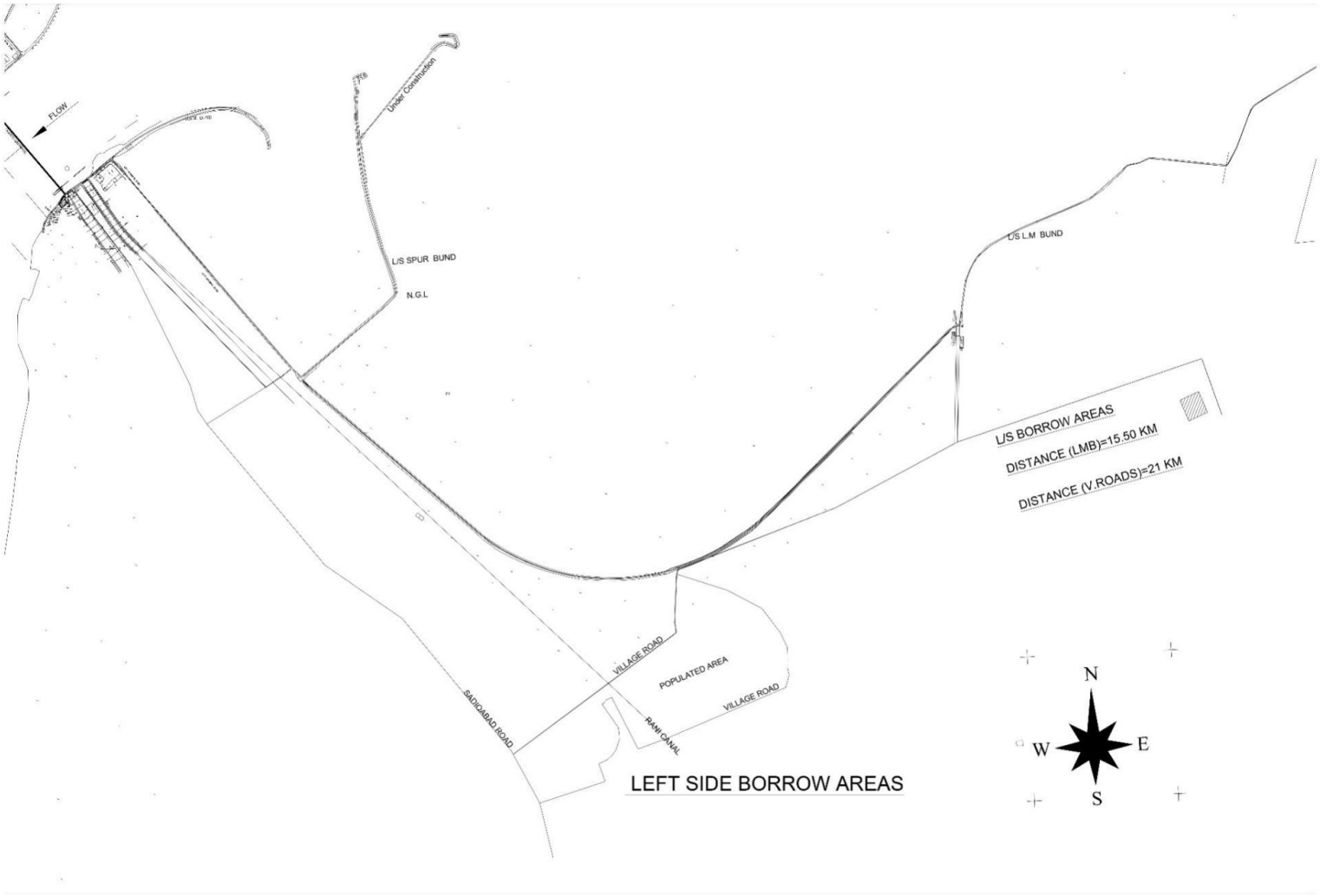


Figure 4.2: Map of borrow area haulage routes (left side)

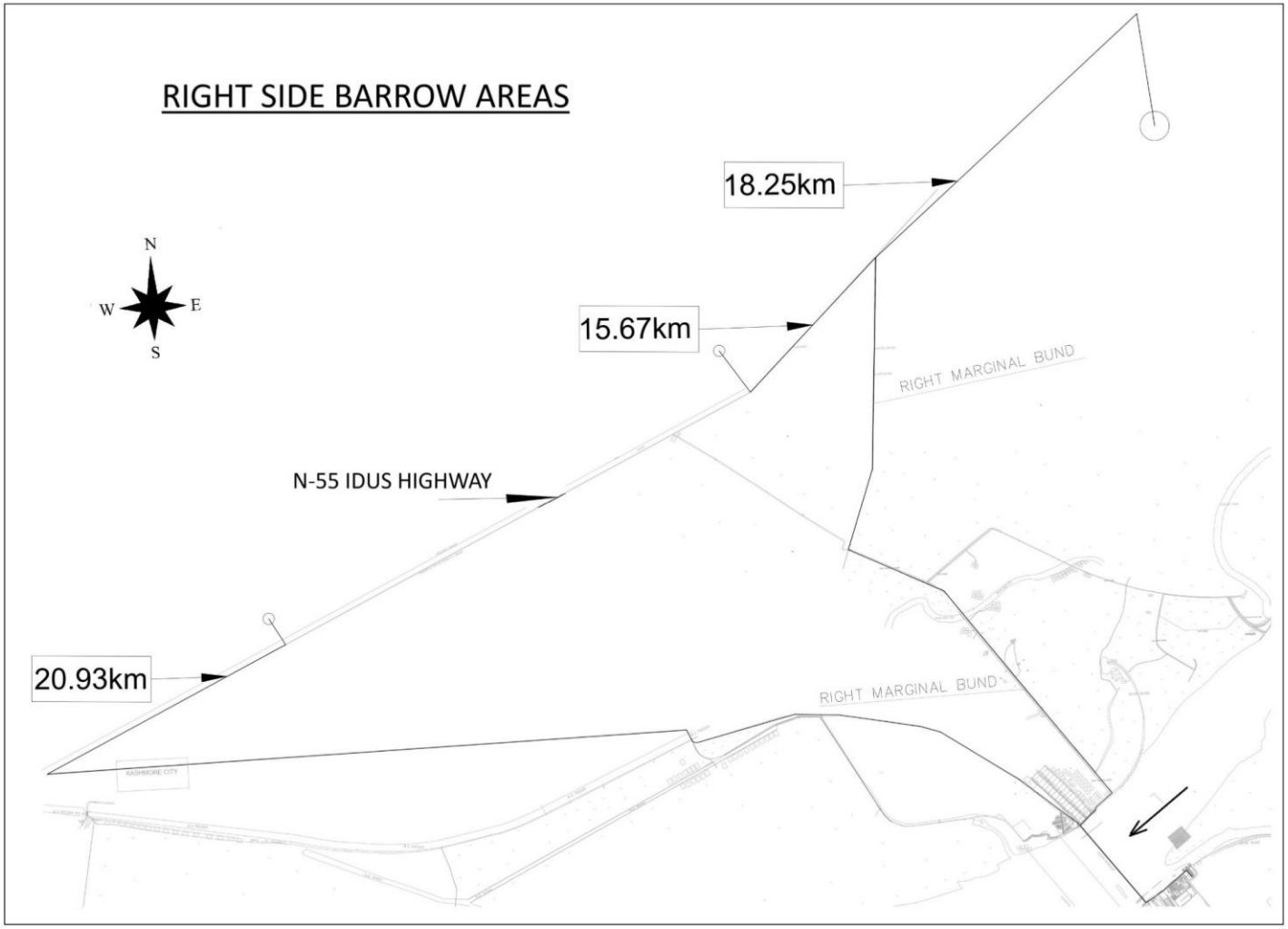


Figure 4.3: Map of borrow area haulage routes (right side)

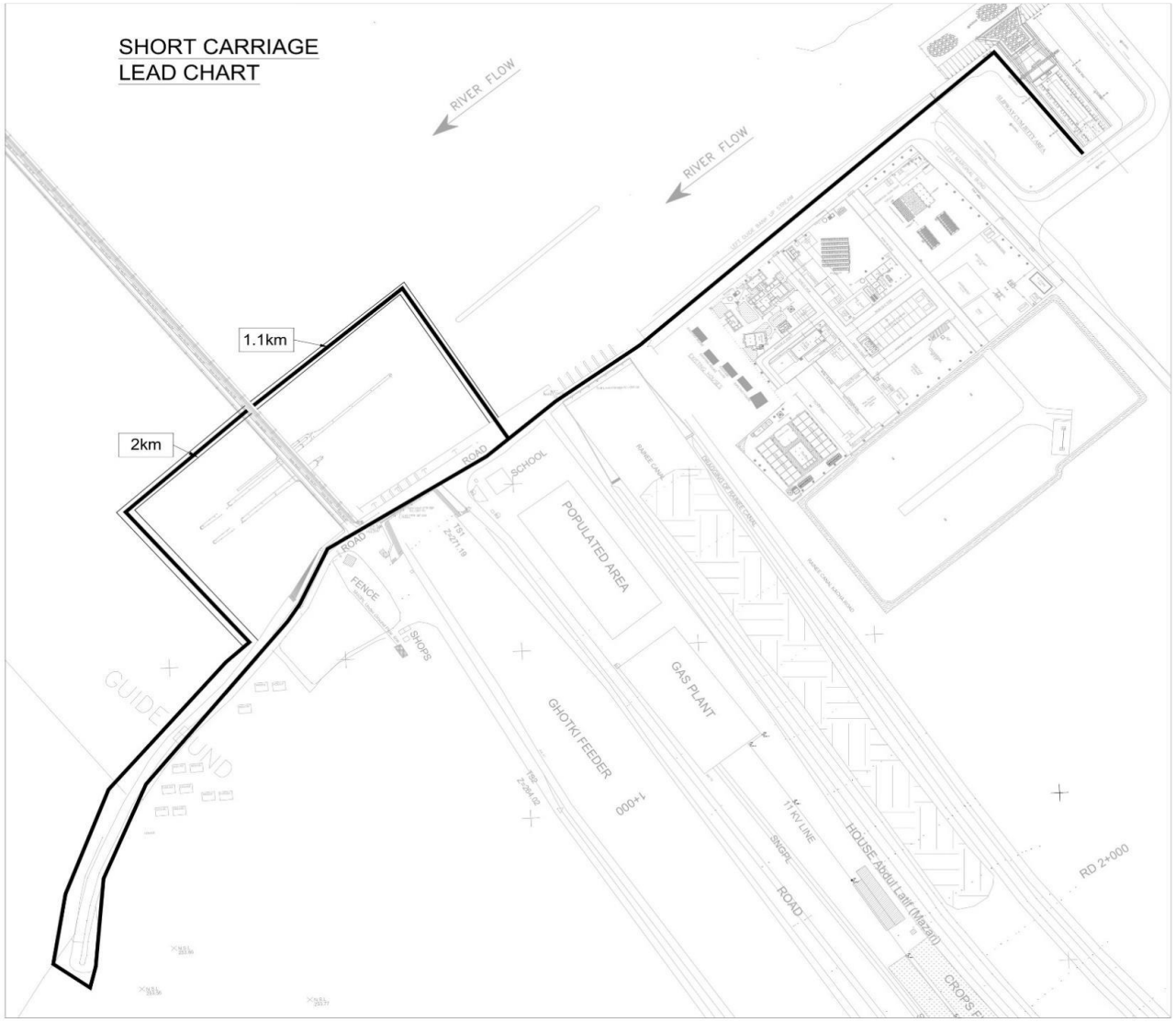


Figure 4.4: Map of localized haulage (re-handling)

5 Institutional Arrangements and Implementation

5.1 Institutional Arrangements

The existing PMO's organogram for implementation of the SBIP, including this SS-ESMP, is shown in Figure 5.1.

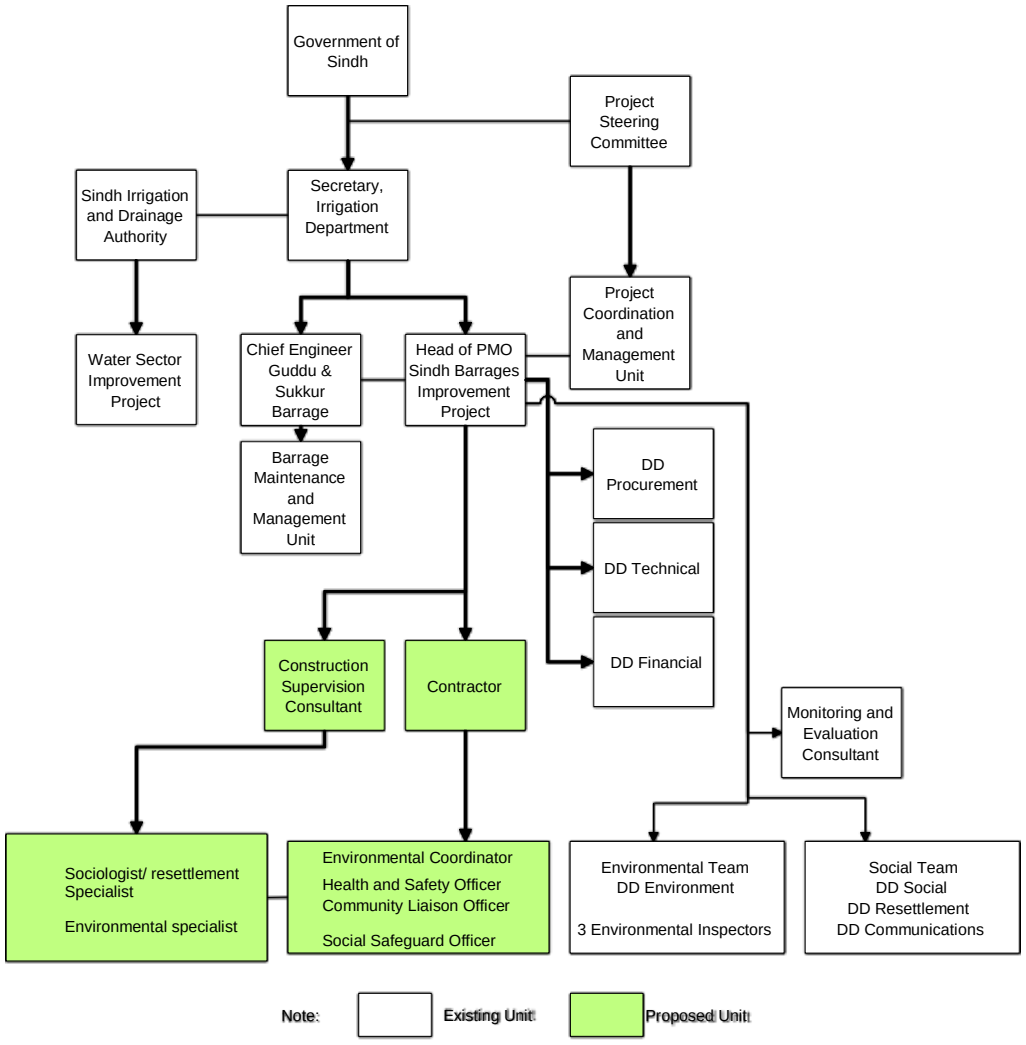


Figure 5.1: Institutional Structure for Implementation of SBIP ESMP

The existing capacity has been reviewed and found sufficient to cover the additional VO-18 works that are covered in this SS-ESMP. The Contractor has an existing night shift and has deployed their supervision team in alternative shifts as required.

PMO have a fulltime environmentalist deployed at the Guddu site who will play a critical role in daily monitoring of the works against this SS-ESMP. In addition, PMO have deployed four additional supporting team members fulltime at Guddu site who will support with stakeholder liaison during the works, critically with NHA and district authorities regarding the road diversion and Traffic Management Plan.

The CSC's Environmental and Social Coordinator, Environmentalist and Sociologist are primarily based at Guddu site, and will be supported by regular due diligence visits from their Senior

Environmental Specialist and Senior Social Specialist. The CSC shall review and accept the CESMP and HSP.

All staff associated with these works will be briefed on the SS-ESMP and corresponding CESMP and HSP accordingly.

5.1.1 Project Management Office (PMO)

SID is the Project proponent. The PMO, already established under the secretary of the SID, will monitor and coordinate all project implementation activities. PMO is responsible for all aspects of project implementation, including technical, operational, financial management, and overseeing the implementation of ESMP. PMO has the following environmental and social staff.

- Deputy Director Environment.
- Deputy Director Resettlement.
- Deputy Director Social.
- Deputy Director Communications.
- Various social and environmental inspectors (site-based and visiting experts)

5.1.2 Contractors

Contractor is required to have the following environmental staff as part of their current contractual duties. These staff will also be responsible to implement this SS-ESMP for the silt excluder works.

The Contractor will develop the updated CESMP and HSP and will be reviewed and approved by the CSC and PMO. These plans will also be reviewed by the World Bank for any advice. l The Contractor will organize and implement all necessary and relevant trainings to its concerned staff before starting the physical works on site. The following key personnel are required in the Contractor's ESHS team:

- Environmental Coordinator.
- Ecologist.
- Health and Safety Officer.
- Health and Safety Supervisor.
- Community Liaison Officer.

5.2 Environmental and Social Management During Construction

5.2.1 Environmental Codes of Practices

The ECPs will provide guidelines for best-operating practices and environmental management guidelines to be followed by the contractors for sustainable management of all environmental issues. These ECPs have been prepared based on the experiences in the construction of irrigation and hydropower projects, including World Bank-funded projects in Pakistan and also in conformity with the WBG EHSGs and Good International Industry Practice.

The list of ECPs prepared for the overall Project is given below, noting all have some relevance to this VO-18 scope of works.

- ECP 1: Waste Management;
- ECP 2: Fuels and Hazardous Goods Management;
- ECP 3: Water Resources Management;
- ECP 4: Drainage Management;
- ECP 5: Soil Quality Management;
- ECP 6: Erosion and Sediment Control;

- ECP 7: Top Soil Management;
- ECP 8: Topography and Landscaping;
- ECP 9: Quarry Areas Development and Operation;
- ECP 10: Air Quality Management;
- ECP 11: Noise and Vibration Management;
- ECP 12: Protection of Flora;
- ECP 13: Protection of Fauna;
- ECP 14: Protection of Fish;
- ECP 15: Road Transport and Road Traffic Management;
- ECP 16: Labor Influx Management and Construction Camp Management;
- ECP 17: Cultural and Religious Issues;
- ECP 18: Workers Health and Safety;
- ECP 19: Dredging Management; and
- ECP 20: Dolphins Management from Construction Impacts**.**

5.2.2 Pre-construction Stage Mitigation Plans

Pre-construction stage will mainly include the finalization of the CESMP and HSP of the Contractor.

Finalizing the consultations and agreements with key stakeholders, and communicating the upcoming plans for the works, are also key actions required before work commences.

5.2.3 Construction Stage Mitigation Plans

Detailed mitigation plans for construction stage impacts have been prepared based on the detailed impact assessment covered under Chapter 4 and presented in Table 5.1. These plans are project-specific, and to the extent possible, site-specific; however, contractors will be required to prepare site-specific management plans as part of CESMP for review and approval of PMO.

Table 5.1: ESHS Impacts and Risks in Construction and Mitigation Measures

Impact	Specific VO-18 related Mitigation Measures	Generic Mitigation Measures	Responsibility	
			Implementation	Supervision
Disruption to Canal Supplies	• Consultations undertaken with SIDA, Ghotki Area Water Board, NGO and key other water-users. Schedule and mitigation measures developed with consultee feedback considered. • Construction of temporary supplies channel to Ghotki Feeder Canal. A channel of 2000 cusecs shall be provided. • SIDA and Ghotki Area Water Board to enact a water allocation governance process to ensure equity to all users, including those at the tail. • Construction period to be stipulated in the VO, with importance of this requirement noted. • Detailed work plan to be provided by the Contractor with some in-built contingency (including time and provision for additional plant/workers) for potential delays. • Pond level to be kept to at least 250' to allow some minor supplies to be provided to the other canals (whilst not exceeding the design limit of the cofferdam). • Communications given to water users well in advance of the works and during them. • CSC to closely monitor the progress of works and issue clear warnings for delays to ensure that the works will complete on time by 15th May 2026. Consideration shall be given for early start if there is no impact on the water users (i.e. appropriate supplies can be provided).		Contractor & PMO	PCMU
Cultural conflicts and security	• Use experience from the previous SBIP/G3 project to inform the selection of borrow areas with considerations for security and access. • Contractor CLO supported by PMO and PIC social experts to undertake consultations with communities adjacent to the new work areas during the works to maintain relations and capture any grievances.	Refer to CESMP and HSP for other mitigation measures required (see Annexure B for the list of sub-plans in the	Contractor	CSC
SEA/SH	• Awareness to communities in new works areas, particularly vulnerable groups including women and male and female children, to understand the risks of SEA and SH and the roles and responsibilities of parties involved in project implementation on SEA and SH prevention, processes for reporting incidents of project-related SEA/SH, and the corresponding accountability structures;		Contractor	PMO
Workers' health and safety	• Conduct a Job Hazard Analysis to identify potential hazards that may arise from the proposed works or working conditions for the project workers and implement necessary control measures. The job hazard analysis shall be part of the Contractor's Method Statement. • Contractor will prepare and implement an updated version of the Health & Safety Plan. This shall contain general guidance for all identified hazards		Contractor	CSC

	under each work activity, and site-specific HS hazards and risks during construction, and control and preventive Measures proposed by the Contractor. The OHS plan will be reviewed by the CSC and PMO and approved accordingly to ensure that it aligns with this ESA. • The Contractor will prepare a Permit to Work system based on the Job Hazard Analysis and competency assessment for staff required for the activity. • Regular site inspections by the CSC and PMO ESHS experts. • Regular training program for workers on occupational health safety (monthly training and daily toolbox talks). Special attention will be focused on the working on water and cofferdam related risks, including use of rescue boat, life vests, ring buoys, and emergency response plan (including for cofferdam breach). • Incident investigation and reporting, including a complete record of accidents and near misses, will be maintained. • First aid facilities will be made available at the worksites. • Contractors will have dedicated and qualified staff to ensure compliance with the H&S Plan. Awareness-raising material will be used, including posters, signages, pamphlets, and others at the worksites.	existing CESMP)		
Temporary road diversion and haulage-related impacts	• Contractor will develop an updated traffic management plan for the works, that is in compliance with ECP 15 on Traffic Management. • Undertake consultations with National Highways Authority and gain consent for the works and the corresponding traffic management plan. • Sessions with Contractor CLO will be undertaken in local communities to discuss routes, reasons for the works, schedule, etc. They will also discuss the risk to children playing in the area, and ensure that information regarding the risks to be disseminated to all in the local community.		Contractor	CSC
Cofferdam	• Ensure that the works as compared to the design is implemented. • Ensure that a daily cofferdam monitoring plan is developed by the Contractor with regards to risk of breach. • Trigger levels for the findings from the above surveys will be well defined. The plan will be jointly implemented by the Contractor with close daily supervision of CSC. • Emergency response plan to be developed by the Contractor that specifies actions to be taken following any signs of risk of breach (as identified in the monitoring plan above). Plan to include rescue measures for rapid inundation, and shall include alarm process, evacuation routes, muster points, communication procedures, provision of divers at all times during the works for enacting the rescue procedures. The emergency response plan shall be added to the Contractor's HSP. • Emergency drills to be undertaken for the above evacuation procedures. All visitors to be briefed on these requirements, as well as the Contractor's workers.		Contractor	CSC

	• Close liaison with the Barrage Authorities to ensure that the pond level is kept below the cofferdam design level. • Ensure that the removal of the cofferdam is undertaken to avoid high concentrations of sediment in the river at one time. The BoQ for the works shall include an item for cofferdam removal accordingly. Cofferdam shall be fully removed with sediment flushing if required to ensure that there shall be no obstruction to barrage and canal flows after the works.			
Silt excluder removal	• The Method Statement for the works shall be developed by the Contractor and reviewed by CSC; acceptance to be granted prior to the work commencing. • The storage, transport and storage of expansive compound shall be closely controlled as per the MSDS and manufacturer's guidance so as to minimize associated risks (pollution and safety). This will include pollution prevention measures such as defined bunded storage area of the expansive mortar, spill kits, MSDS sheets posted at site. • A trial of the expansive compound shall be undertaken prior to the works commencing to ensure that specific quantities and methods utilized are appropriate. • The use of demolition equipment (jackhammers, cutting tools) shall only be undertaken by trained workers. • All staff and visitors who will enter the cofferdam area are to be given awareness briefing on the risks associated with being a bystander to these demolition works. • Existing structure to be monitored as per plan jointly developed with the Contractor, CSC and the end user of the barrage. • Waste handling shall be controlled with strict prevention of dumping of mortar and concrete waste in the river. Locations for temporary storage to be clearly defined and controlled, together with transport routes to the disposal areas. Disposal plan shall be included in the Contractor's CESMP.		Contractor	CSC
Borrow and disposal areas	• Disposal of the silt excluder debris shall be in approved area within Irrigation Department Land. • Borrow areas shall be pre-approved by CSC prior to their use. Screening criteria as used on the project shall be implemented, which includes landownership checks, no sensitive habitats, no drainage, reinstatement plan, no social issues (evidence by community consultations).		Contractor	CSC

5.3 Monitoring Plan

Proposed monitoring plan to be carried out during the implementation of the Project to ensure the Contractor's compliance with the mitigation measures is given in the following Table, along with the monitoring indicators[1] and frequency. CSC will be responsible for the supervision of the implementation of the plan.

Table 5.2: Effects Monitoring Plan

Parameter	Means of Monitoring	Frequency	Responsible Agency	
			Implementation	Supervision
Ecological monitoring (dolphins)	Field investigations for observations on dolphin or turtle entrapment	Hourly during initial closure. Then daily.	Contractor	CSC, PMO
Air Quality (dust, smoke)	Visual inspection to ensure good standard equipment is in use	Daily	Contractor	CSC, PMO
	Third-party air quality testing	Quarterly	Contractor	CSC, PMO
	Visual inspection to ensure the dust suppression work plan is being implemented	Daily	Contractor	CSC, PMO
Emissions from plant and equipment	Visual inspection	Daily	Contractor	CSC, PMO
	Third party emissions testing	Quarterly	Contractor	CSC, PMO
Noise and vibration	Spot measurements	Monthly	Contractor	CSC, PMO
Waste Management	Visual inspection that solid waste is disposed of at designated sites	Daily	Contractor	CSC, PMO
Spills from hydrocarbon and chemical storage	Visual inspection for leaks and spills	Monthly	Contractor	CSC, PMO
Labor management	Records on terms and conditions of employment, including hours of work, wages, overtime, compensation and benefits, holidays, leaves, CoCs and other requirements. Review of grievances and actions taken	Monthly	Contractor	CSC, PMO
Safety of workers	Usage of personal protective equipment Availability of rescue equipment for drowning Safety drills	Daily	Contractor	CSC, PMO
Traffic management	Visual inspection of haulage roads for damage Check of vehicle log books drivers' license etc. Speed control Trucks inspections	Monthly	Contractor	CSC, PMO

[1] CESMP will include the details of parameters to be measured at site for air, noise, water quality along with reference to National Environmental Quality Standards (NEQS) and locations.

Water quality testing (drinking for laborer)	Third party water quality testing	Quarterly	Contractor	CSC, PMO

5.4 Reporting on ESMP Compliance

PMO and its Contractors will prepare periodic monitoring reports on the status of implementation of ESMP and will be submitted to World Bank for their review and feedback. Details of these reports and their content are given in the following Table. As discussed in the original ESA, external third -party environmental monitoring and audits will be undertaken as required.

Table 5.3: ESMP Monitoring and Compliance Reports

#	Title of the Report	Contents of the Report	Frequency of Report Preparation	Report to be prepared by
1	ESHS Monitoring Report	The compliance status of the Project with environmental and social mitigation and monitoring measures. Besides, the report also covers: • Environmental incidents • Health and Safety incidents • Health and Safety supervision • Major compliance issues • Labour management and worker accommodations • Training conducted and workers participated • Worker's grievances • Community grievances, including incidents of SEA/SH • Chance find (if any)	Monthly	Contractor
2	ESMP Monitoring Report	The compliance status of the overall Project with ESMP requirements	Quarterly	PMO
3	Incident Reports	Incident investigation reports for all major incidents covering details of the incident, root cause analysis, and actions taken to address the future recurrence of this event	Initial notification report within 24 hours. Detailed Investigation Report within ten days	Contractor

5.5 Capacity Building and Training

The environmental and social training will help to ensure that the requirements of the ESMP are clearly understood and followed by all project personnel. ESHS specialists of the Contractor are responsible for delivering these programs for their staff.

The specific training contents is as follows and will be included in the updated CESMP and HSP.

Table 5.4: Environmental and Social Training – modules recommended

Subject	Target Audience
Handling, use & disposal of hazardous material	Construction workers with authorised access to hazardous material storage areas and required to use hazardous materials during their works

Waste Management	All staff (construction and camp staff)
Efficient & safe driving practices, including road & vehicle restrictions	Mandatory for all drivers & mobile plant operators
Actions to be taken in the event of major or minor pollution event on land	All construction staff
Pollution prevention: best practice	All staff
Pollution prevention: Refuelling waterborne plant and vehicles	Operators of waterborne plant and vehicles
Pollution control: Use of spill kits	All construction staff working near water
Health & Safety: Safe way to work & hazard awareness, including working on or close to water	All construction staff
Health & Safety: Safe use of plant & equipment, including water-based plant and equipment	Operators of plant & equipment
Health & Safety: Use of PPE	All construction staff
Emergency procedures and evacuation	All staff
Fire fighting	All staff
Site inductions, including requirements under the Environmental Management Plan & details of environmentally sensitive areas of the site, with a focus on the Indus Dolphin Reserve	All staff
Culturally sensitive awareness raising on SEA/SH, HIV/AIDS and the spread of sexually transmitted diseases. Awareness raising on risks, prevention and available treatment of vector-borne diseases	All staff
Cultural sensitivities of the local population	All staff
Modules of SEA/SH	All staff

5.6 Grievances[2]

As per the original ESA, grievances are actual or perceived problems that might give grounds for complaints. As a general policy, the Contractor and PMO will work proactively at this site towards preventing grievances through the implementation of impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. As described in the ESA, for the original Project, a project level Grievance Redress Mechanism (GRM) has been established and the same will be used for the additional VO-18 works. Community GRM addresses complaints related to both Guddu and Sukkur's ESMP/SMF as well as the project implementation, while Procurement GRM specifically addresses procurement related issues.

For CGRM, the Contractor will be responsible for establishing a process for registering and discussing complaints, and corresponding procedure to resolve them that follows the required guidelines. It is recommended that a forum is developed for community representatives to share their concerns, as well as an anonymous procedure (i.e. complaint box). Both these processes must consider methods for women to access this process. Supported by the CSC, the Contractor will then work to resolve the complaint.

[2] Detailed GRM is given in Updated SMF of SBIP.

Complaints which are not resolved at site by the Contractor are to be forwarded to the project executing authority (PMO) to address. For this purpose, a complaint cell has been set up at PMO in Sukkur, chaired by the Deputy Project Director. If a complaint is not resolved locally, it could be escalated to a Grievance Redress Committee set up in Karachi. The GRM is shown in Figure 5.2 and the members of the complaint cell are shown in Table 5.5. The SBIP GRM is detailed in SMF.

Table 5.5: PMO Complaint Cell

S No.	Designation	Position
1	Deputy Project Director, PMO-SBIP	Chairman
2	Executive Engineer (Guddu Barrage) Or Executive Engineer (Sukkur Barrage)	Member
3	Deputy Director (Environment) PMO	Member
4	Representative of CSC	Member
5	Representative of Contractor	Member
6	Technical Officer PMO	Member
7	Deputy Director (Resettlement) PMO	Secretary

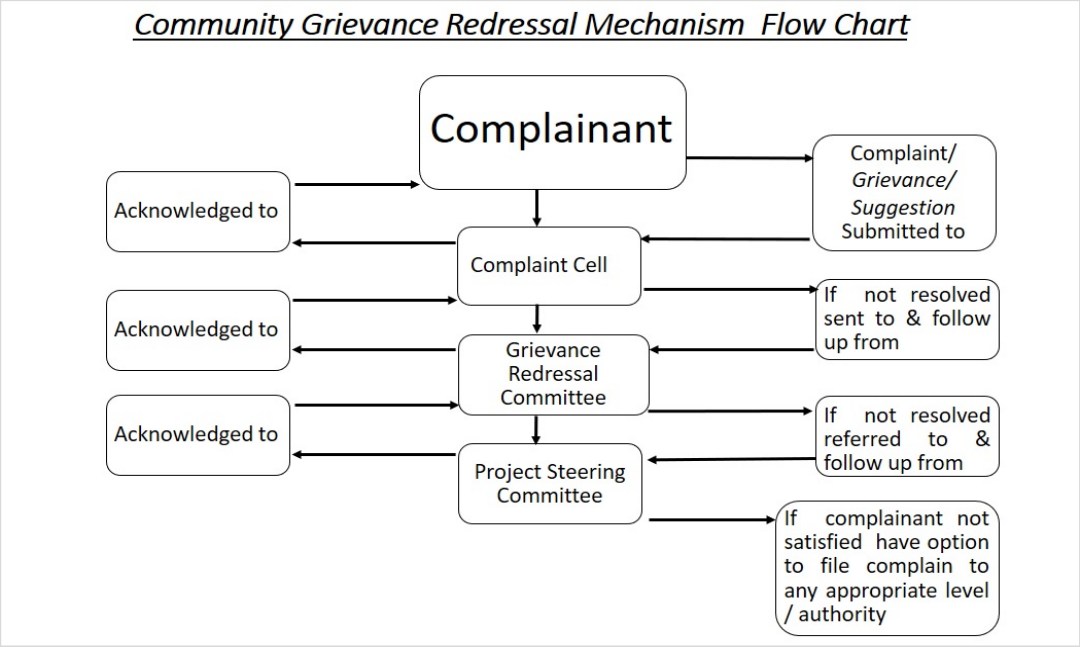


Figure 5.2: Grievance Redress Mechanism

6 Stakeholder Consultations and Disclosure

6.1 Previous Consultations

For the original ESA, extensive consultations were carried out throughout the project preparation.

6.2 Identification of Water Users

An exercise has been undertaken to identify the water users of Ghotki canal. From the consultations undertaken with SIDA and Ghotki Area Water board, it is noted that currently the canal supplies water to:

- Farmers of Ghotki Area Water board

- Industrial users
- Drinking water

6.3 Consultations for Silt Excluder

An exercise has been undertaken to identify required consultees for the works, resulting in the following consultees:

1. SIDA: Water user
2. Ghotki Area Water Board: Water user
3. Farmer organizations (FOs)
4. Local Communities
5. Engro Fertilizer Company: Water user
6. Guddu Barrage Authorities: End-user / operator
7. Communities local to the area of works: Impacts from construction such as traffic.
8. SNGPL: Utility provider crossing the Site
9. NHA: Utility provider crossing the Site
10. PTCL and optical fiber: Utility provider crossing the Site
11. SEPCO
12. Kashmore and Ghotki local administration: Impacts from construction such as traffic.
13. Communities in the command area: Water user
14. Local NGOs in the command area: Impacts from construction and on water users (including on vulnerable groups).
15. ASP Kashmore: Impacts from construction such as traffic.

The various consultations are being undertaken accordingly, supported by specialists from the Irrigation Department (including SIDA). The records of these consultations are enclosed in Annexure A.

The key findings from the consultations are summarized in the following Table.

Table 6.1: Summary of consultations			
Sr	**Stakeholders**	**Key feedback**	**Action**
1	SIDA	• Water users have changed since the Water Accord. • Temporary supplies are required for the industrial users / dischargers along Ghotki Canal. • Closure period should be kept short.	Inclusion of temporary supplies to Ghotki Canal during extended closure period for 2000 cusecs. Communication within GAWB ensured fair allocation of supplies to reach tail users and industrial consumption.
2	Ghotki Area Water Board	• The farms in the command area have a variety of crops. • Temporary supplies are required to Ghotki Canal for an extended closure period. • A discharge of 1500 cusecs is acceptable up to mid May but It was ensured that temporary supply will be 2000 cusecs.	
3	Engro Fertilizer Company	• Temporary supplies are required to supplement their temporary storage capacity (30 days).	Provision of temporary supplies.
4	Guddu Barrage Authorities	• Closure period should be limited to avoid disruption to the right bank canals also from lower water level. • Water level in April closure varies depending on incoming flow rate and is not in control.	Design cofferdam for range of incoming flow rates and corresponding pond level.
5	Communities local to the area of works	• Traffic diversion plan is noted and users with light vehicle may elect to use the right bank of Ghotki Canal. • Dust and noise shall be controlled. • Privacy screenings requested. • Process for jobs shared by the CLO with the communities.	Consider alternative routes for light traffic in traffic management plan. Ensure clear signage for light vs heavy traffic if so. Dust, noise and privacy measures required.
6	Sui Gas	• Protection is required to the gas pipeline in line with the department's guidance. • NOC is required. • Measures required include pipeline supports, rip rap protection, protective netting for debris, full restoration works, limitation on depth for heavy machinery passing, and presence of SNGPL during the works.	Obtained NOC.
7	NHA	• SOP for road cutting is not available in the department. Senior officials to review plans. • Request was submitted to NHA for providing NOC for cutting of diverting canal	Obtained NOC.
8	PTCL	• Protection of Optical Fiber required.	PTCL agreed for taking necessary action.
9	SEPCO	• 11 KV line crossing the works to be raised.	SEPCO to raise KV lines as per request

10	Districts' Kashmore and Ghotki management	• Traffic management plan should be strictly followed and implemented. • Clear signage required for light vs heavy traffic.	Ensure robust traffic management plan is developed and daily monitoring is undertaken by CSC and PMO.
11	Communities in the command area	• This activity is good for farmers in the long term as silt excluder removal may improve supplies to the canal. • Temporary supplies appreciated. • Process for jobs shared by the CLO with the communities.	Provision of temporary supplies.
12	HANDS; local NGO in the command area	• Cooperation / support to circulate awareness regarding silt excluders works challenges e.g. temporary supplies and road diversion. • HANDS recommended some kind of awareness posters or instructions therefore, to circulate and communicate in their networks.	PMO to create awareness poster / pamphlet.
13	ASP Kashmore	• Traffic management measures and law and order were discussed and noted.	Ensure robust traffic management plan is developed and ASP ensured for security

6.4 Communication and consultation during SS-ESMP implementation

Water users will be updated throughout the works to confirm that the schedule is as planned. Any changes will be communicated through the same channels.

CSC will inform the Irrigation Department and information shall be disseminated via SIDA and Ghotki Area Water Board.

Information shall also be made public via:

- Local media.
- Social media.
- Dissemination of flyers in the local area.
- Posting of signboards near the approach roads.
- Radio announcements.

The Irrigation Department shall disseminate the status of the works on a 10 daily basis to the water users via the Ghotki Area Water Board (via the use of a public information dashboard and/or bulletin). On a daily basis, there is an existing procedure in which the SID provides an allocation bulletin to the water users.

During the works, consultations will continue with the district governments, NGO and local communities regarding any unforeseen impact of the road diversion.

Consultations will also continue with the water users to ensure that the impacts are minimized and are as expected. PMO and the Contractor's CLO shall be responsible to undertake these consultations with the various water users throughout the works.

The use of complaints box and complaints register at the diversion location will be implemented.

6.5 Disclosure

The ESA 2014 summary and ESA reports are already disclosed on the SID website and World Bank's external website. This SS-ESMP will also be disclosed on both the SID and SIDA websites in February 2026 in English language with Urdu and Sindhi translations of the Executive Summary. The hard copies of the documents will be made available to the communities through the library of the Sukkur Barrage.

Annexure A – Consultations

A.1 Consultations with Water Users

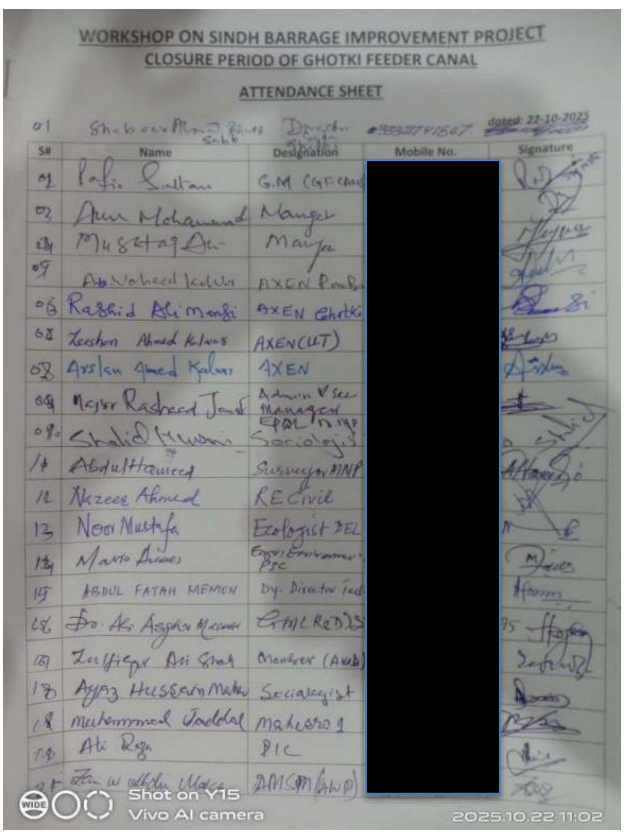
22nd October 2025

Attendees: SIDA, Ghotki Area Water Board, Contractor, PIC, PMO.

Agenda: Workshop for water users regarding extended closure.

Findings: The requirement for the silt excluder works was explained by the project team to the participants. A detailed discussion was held on the current typical water demand for the months of March, April and May. It was noted that there are various industrial users, AWB' members, Farmers Organizations, local communities and other related stakeholders require discharge in Ghotki Canal. The participants were appreciative of the option to provide temporary supplies with demand between about 500 to 2000 cusecs. It was concluded that a supply of minimum 500 cusecs for the extended period (15th March-15th May,2026 would be suitable. Furthermore, comprehensive discussion was carried out on Traffic flow through diversion of left and right of canal. They appreciated that Traffic Management Plan is suitable for work period. List of attendance and photographs of Participants are given below.

Records:

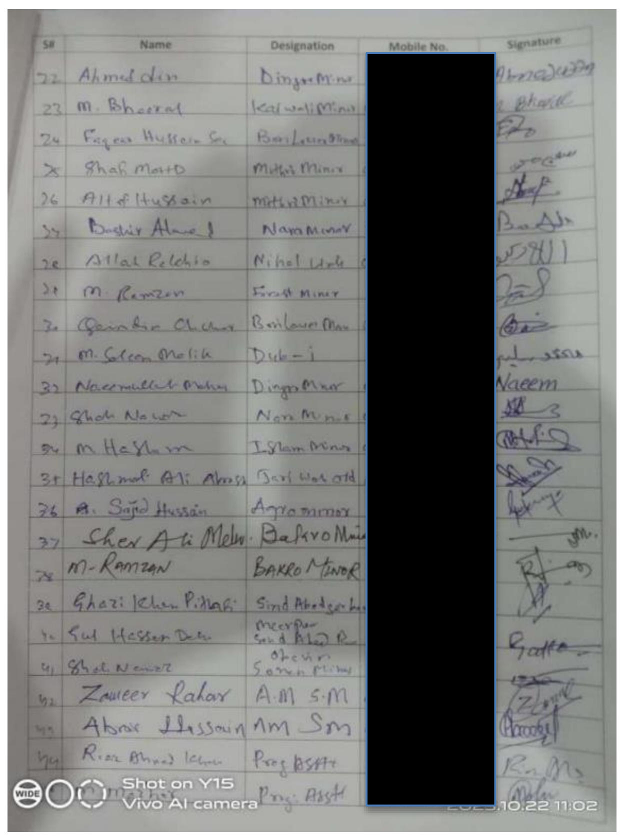


WORKSHOP ON SINDH BARRAGE IMPROVEMENT PROJECT
CLOSURE PERIOD OF GHOTKI FEEDER CANAL

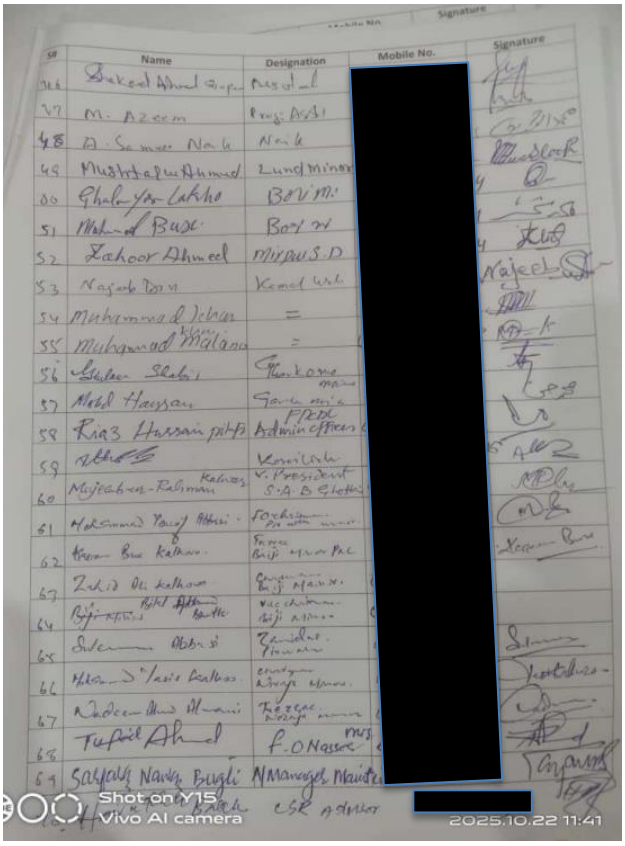
ATTENDANCE SHEET

dated: 22-10-2025

S#	Name	Designation	Mobile No.	Signature
01	Shabeer Ahmed [illegible]	Director [illegible]	[illegible]	
01	Rafiq Sultan	G.M (GF Canal)	[redacted]	
02	Amir Mohammad	Manager		
03	Mushtaq Ali	Manager		
04	Ab. Waheed Kalhor	AXEN [illegible]		
05	Rashid Ali Mangi	AXEN Ghotki		
06	Zeeshan Ahmed Kalwar	AXEN (LT)		
07	Arslan Ahmed Kalwar	AXEN		
08	Nasir Rasheed Jawed	Admin & Sec Manager		
09	Shahid Hussain	EPQL D.M.P Sociologist		
10	Abdul Hameed	Surveyor MNP		
11	Aziz Ahmed	RE Civil		
12	Noor Mustafa	Ecologist DEL		
13	Mario [illegible]	Env. Environment PSC		
14	ABDUL FATAH MEMON	Dy. Director [illegible]		
15	Dr. Ali Asghar Memon	GM (Retd) [illegible]		
16	Zulfiqar Ali Shah	Member (AWB)		
17	Ayaz Hussain Mahar	Sociologist		
18	Muhammad Jaddal	Mahesro 1		
19	Ali Raza	PIC		
20	[illegible]	AM SM (AWB)		



S#	Name	Designation	Mobile No.	Signature
22	Ahmed din	Dingro Minor	[redacted]	
23	M. Bhooral	Kalwali Minor		
24	Faqeer Hussain [illegible]	Bari Lower Minor		
25	Shah Murad	Mithri Minor		
26	Altaf Hussain	Mithri Minor		
27	Bashir Ahmed	Naro Minor		
28	Allah [illegible]	Nihal [illegible]		
29	M. Ramzan	[illegible] Minor		
30	[illegible]	Bari Lower Minor		
31	M. Saleem Malik	Dub-i		
32	Naeemullah [illegible]	Dingro Minor		
33	Shah Nawaz	Naro Minor		
34	M Haslam	Islam Minor		
35	Hashmat Ali [illegible]	[illegible]		
36	A. Sajid Hussain	Agro [illegible]		
37	Sher Ali Mehar	Bakro Minor		
38	M-RAMZAN	BAKRO MINOR		
39	Ghazi Khan [illegible]	Sind Abadgar [illegible]		
40	Gul Hassan [illegible]	Meerpur Sind [illegible]		
41	Shah Nawaz	Obhairo Soomro [illegible]		
42	Zameer Rahar	A.M S.M		
43	Abrar Hussain	AM SM		
44	Riaz Ahmed Khan	Proj Asstt		
	[illegible]	Proj. Asstt		



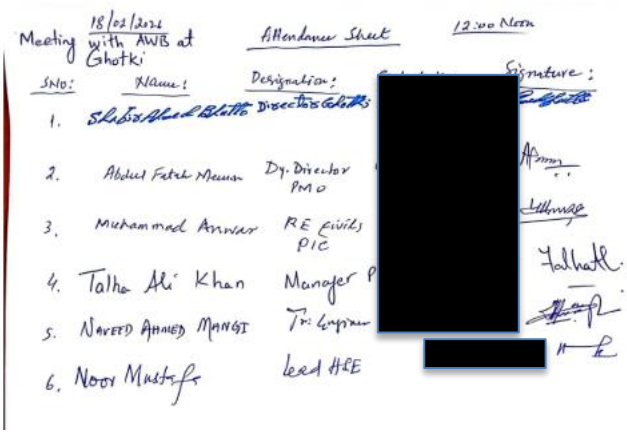
18th February 2026

Attendees: Ghotki Area Water Board, PMO, PIC, Contractor.

Agenda: Discussion with water user regarding extended closure.

Findings: PMO briefed the Director GAWB on the request for early start of the works in February 2026. They confirmed that the diversion channel will be for 2000 cusecs which is greater than the current flows. Drawings were provided to GAWB of the channel. Detailed discussions were held accordingly. Director GAWB desired to visit the diversion channel site of work; the site visit will be scheduled in the same week accordingly. AWB had no objection on the basis that the temporary supplies would be provided.

Record:



10th February 2026

Attendees: Engro Fertilizer Company and the Contractor.

Agenda: Temporary supplies for industrial works.

Findings: The meeting was with Engro Fertilizer Company. The Public Affairs Manager for Engro briefed on the requirement for their incoming / outgoing flows with Ghotki Canal. They noted that they have limited supplies in their storage ponds for around 30 days. The Contractor team ensured on the planned temporary diversion channel for the continuous supply of water in Ghotki Canal as per the requirement during the work period. Engro appreciated this measure and confirmed that there are no further concerns.

A.2 Consultations with local community

8th October 2025

Attendees: Community representatives, PMO, Contractor, PIC.

Agenda: Impacts of construction

Findings: The meeting was held with local community for traffic flow during diversion period. The requirement for removal of the silt excluder works and replacement of gates of left pocket of was explained by the project team to the participants. The PMO and PIC team briefed the local communities for traffic flow through diversion paths during works for replacement of gates of left pocket. The team noted potential impacts of the road diversion The local community did not express concern about this diversion, noting that users with light vehicle (e.g., motorbike) may elect to use the right bank of Ghotki Canal. They were informed about the complaint register process. List of attendance and photographs of Participants are given below.

Records:

COMMUNITY CONSULTATION RECORD SHEET
GUDDU BARRAGE REHABILITATION PROJECT-5019

Date: 08/oct/2025
Village: Guddo khan L/S, D/S
Tehsil: Kashmore – Guddu
Topic: Fisherman Consultation Session
UC: Khairwali
District: Kashmore – Kandhkot

Sr. No	Name	[redacted]	Occupation/Skill	Feedback
1	Rafique Ahmed	[redacted]	Fisherman	Discuss Regarding G2/G3 Coffer Dam
2	Ramzan Solangi	[redacted]	"	construction issues & feedback from
3	Shakeel Ahmed	[redacted]	"	Local communities Regarding their
4	Sikandar Ali	[redacted]	"	Concerns, therefore, Local Communities
5	Ali Nawaz	[redacted]	"	Have no issues with that, to Relocate or
6	Dawat Ahmed	[redacted]	"	follow Another/Alternate tracks/Routes
7	Shokat	[redacted]	"	for transportation activities.
8	Waheed	[redacted]	"	
9	Papu	[redacted]	"	
10	Hanif	[redacted]	"	
11	Naveed	[redacted]	"	
12	Waseem	[redacted]	"	
13	Maria Anees	[redacted]	Environ Engineer (PIC)	Rafique Ahmed Mirani
14	Shahid Hussain	[redacted]	Social – PIC	
15	Arshad Pirzada	[redacted]	Enviro – PMO	
16	Azhar Shah	[redacted]	CLO – DEL	
17	Yaseen	–	HSE – DEL	

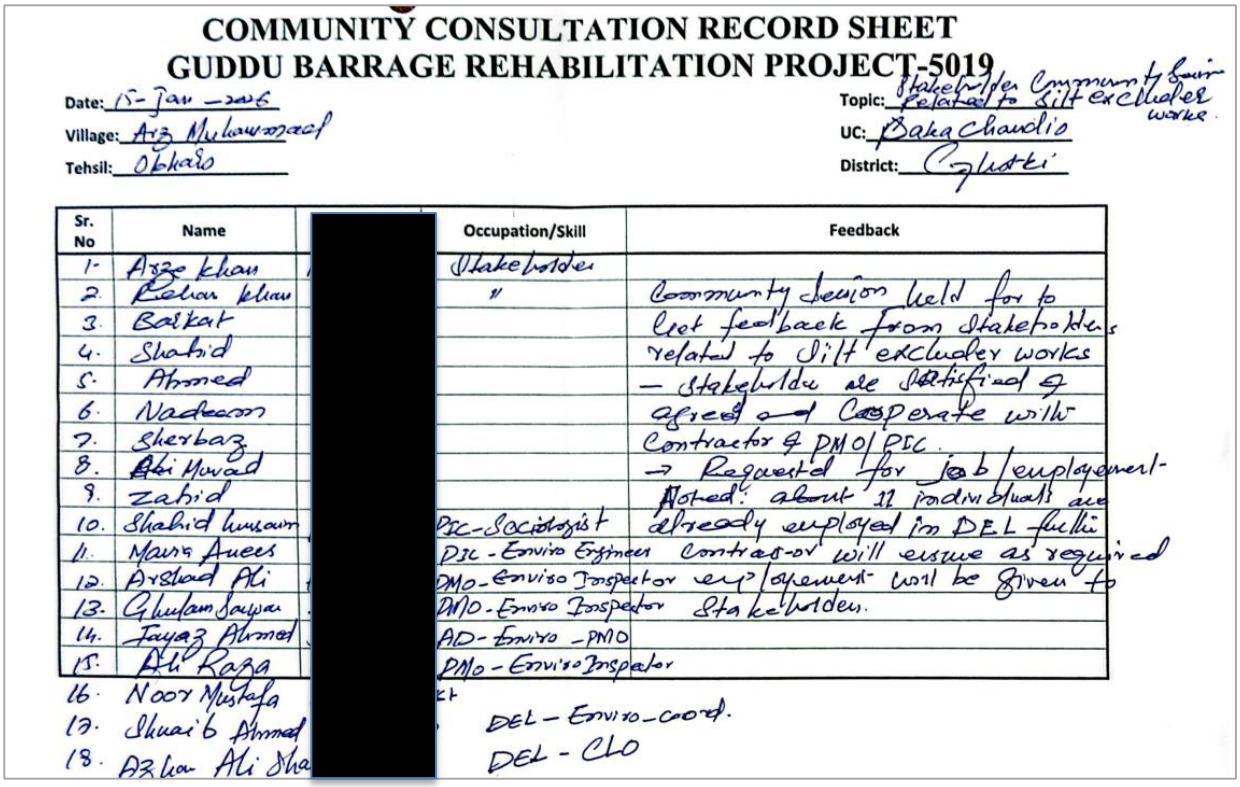
15th January 2026

Attendees: Village Arzi Khan community representatives, PMO, Contractor, PIC.

Agenda: Impacts of construction

Findings: The project team briefed on the silt excluder work and upcoming traffic diversion. Community requested for information for any further job opportunities.

Record: Session at 28°24'20.5"N 69°43'41.4"E



COMMUNITY CONSULTATION RECORD SHEET
GUDDU BARRAGE REHABILITATION PROJECT-5019

Date: 15-Jan-2026
Village: Arz Muhammad
Tehsil: Obkaro
Topic: Stakeholder Community Consultation Related to Silt excluder works
UC: Baka Chandio
District: Ghotki

Sr. No	Name	[redacted]	Occupation/Skill	Feedback
1-	Arzo khan		Stakeholder	
2.	Rahim khan		"	Community session held for to
3.	Barkat			get feedback from stakeholders
4.	Shahid			related to silt excluder works
5.	Ahmed			- stakeholder are satisfied &
6.	Nadeem			agreed and cooperate with
7.	Sherbaz			Contractor & PMO/PIC.
8.	Abi Murad			→ Requested for job/employment-
9.	Zahid			Noted: about 11 individuals are
10.	Shahid Hussain		PIC-Sociologist	already employed in DEL fulki
11.	Mavia Anees		PIC-Enviro Engineer	Contractor will ensure as required
12.	Arshad Ali		PMO-Enviro Inspector	employment will be given to
13.	Ghulam Sarwar		PMO-Enviro Inspector	Stakeholders.
14.	Fayaz Ahmed		AD-Enviro-PMO	
15.	Ali Raza		PMO-Enviro Inspector	
16.	Noor Mustafa			DEL-Enviro-coord.
17.	Shuaib Ahmed			
18.	Azhar Ali Sha			DEL-CLO

12th February 2026

Attendees: Village Arzi Khan community representatives, PMO, Contractor, PIC.

Agenda: Impacts of construction.

Findings: The project team briefed on the silt excluder work and grievance procedure for nearby residents. Dust control measures (water sprinkling) were discussed. In addition, for privacy provision of curtains will be made. CLO committed to remain in close coordination with residents for complaints and any job opportunities. The notables of community were showed their full support about the silt excluder activity.

Record 28°24'09.9"N 69°43'47.1"E

COMMUNITY CONSULTATION RECORD SHEET
GUDDU BARRAGE REHABILITATION PROJECT-5019

Date: 12-2-26
Topic: Stakeholder Community Session Regarding Silt excluder works
Village: Arzi Khan Magsi
UC: Pakka Chandio
Tehsil: Dokri
District: Ghotki

Sr. No	Name		Occupation/Skill	Feedback
1.	Kalam khan		Land Lord	⇒ Request for employment. Therefore
2.	Lal Khan		DEL Employee	about 21 individuals are Already
3.	Shahid Ali		DEL employee	employed at DESCON on Several trades.
4.	Ahmad		DEL employee	⇒ Residents are Satisfied & Contractor
5.	Dadu		Private work	in Cooperation with Villagers.
6.	Wahab		"	⇒ Grievance are Record & Resolved
7.	Lal Muhammad		"	on immediate basis.
8.	Shahbaz Ali		"	
9.	Salam		"	
10.	Shafaat Ali		Land Lord	
11.	Naeem Nalawad		Private work	
12.	Peeral		"	
13.	Shair Ali		"	
14.	Javaid		"	
15.	Nawaz Ahmed		DEL employee	
16.	Nawaz Anees		PIC - Environ Engr	
17.	Shahid Hussain		PIC - Sociologist	
18.	Fayaz Ahmed		AD - Environ PMU	
19.	Arshad		Insp - Environ - PMU	
20.	Amar		Insp - Social	
21.	Syed Asfandi		DEL - CLO	

13th February 2026

Attendees: Village Qabool Waghor community representatives, PMO, Contractor, PIC.

Agenda: Impacts of construction.

Findings: The project team briefed on the silt excluder work and grievance procedure for nearby residents. Discussions were held on the downstream cofferdam works including construction traffic / plant movement.

Record: Session at 28°24'38.6"N 69°42'54.9"E

13th February 2026

Attendees: Village Sher Jan Mazari, community representatives, PMO, Contractor, PIC.

Agenda: Impacts of construction at borrow area.

Findings: The project team briefed on the borrow and haulage requirements of the silt excluder works. They noted the grievance procedure for nearby residents. The community noted that there are no issues at this time. It was appreciated that dust measures will be followed.

Record: Session at 28°29'18.4"N 69°41'01.8"E

Session #01

COMMUNITY CONSULTATION RECORD SHEET
GUDDU BARRAGE REHABILITATION PROJECT-5019

Date: 13-02-2026 Topic: Community Session with Residents of Nearby Borrow Area.

Village: Basti Sher Jan Mazari - Rajanpur UC: Shahwali

Tehsil: Rojhan District: Rajanpur

Sr. No		Tribe	Occupation/Skill	Feedback
1.	A[redacted]	Mazari	Farmer & Landlord	
2.	M[redacted]	〃	〃	→ Near by Borrow area about
3.	[redacted]	〃	〃	1Km. away & Nearby
4.	Z[redacted]	〃	〃	road.
5.	A[redacted]	〃	〃	→ There is No any Grievances
6.	T[redacted]	〃	〃	recorded.
7.	K[redacted]	〃	〃	→ Fencing, Dust Control
8.	G[redacted]	〃	〃	measures are implemented
9.	M[redacted]	〃	〃	& Traffic Management Plan
10.	S[redacted]	〃	〃	implemented.
11.	B[redacted]	〃	〃	
12.	B[redacted]	〃	〃	→ Community is Satisfied
13.	N[redacted]	〃	〃	with works.
14.	A[redacted]		DEL-HSE Incharge	
15.	N[redacted]	Jutt	PIC-Envirio Exp	
16.	Sh[redacted]	Lund	PIC-Social Spst	
17.	Sy[redacted]	Syed	DEL-CLO	

13th February 2026

Attendees: Ghotki farmer community representatives and PMO.

Agenda: Shared the awareness about silt excluder activities and temporary supplies with Farmers

Findings: PMO E&S team conducted community consultation with the farmers of the Ghotki Canal near Village Abdul Ghani Jatoi near Korai Minor Pano Aqil. The project team shared the scope and importance of the silt excluder activities. The farmer community suggested that this activity is good for them as due to this activity the reach and water capacity of water will likely be increased and the farmers of the tail area should receive more proportion of water in their lands. PMO representatives informed the farmers about the time period of annual closure of Ghotki Canal and the provision of temporary supplies. The project team ensured that about 2000 cusecs of water supply during work period through diversion.

11th February 2026

Attendees: HANDS (NGO), PMO, Contractor, PIC.

Agenda: Impacts of canal closure and construction works

Findings: An awareness meeting was conducted with representatives of HANDS NGO in the Kashmore city. The project team briefed on the works including the supplies during the extended canal closure, and potential construction impacts. Detailed discussions were held. PMO requests HANDS team to support us to circulate awareness regarding silt excluders works challenges e.g. temporary water supplies and traffic flow through road diversion. The team and District Manager of HANDS NGO ensured that further they will share this awareness of silt excluder activities, water diversion with local people and community through social media and gatherings. HANDS recommended some kind of awareness posters or instructions therefore, to circulate and communicate in their networks.

Record:

A.3 Consultations with NHA

15th January 2026

Attendees: NHA, PMO, PIC.

Agenda: Road diversion

Findings: The requirement for the silt excluder works and replacement of gates of left pocket of Guddu barrage was explained by the project team to the participants. The team briefed on the road diversion required. NHA representative informed that an SOP for road cutting is not available in the department. They noted that senior officials will be required to review plans of the project accordingly. The PMO team coordinated with NHA office Sukkur to seek NOC for cutting road for construction of diversion for supplying water to Ghotki Feeder canal. The NHA issued NOC for cutting road (Copy attached)

Records:

NATIONAL HIGHWAY AUTHORITY
(Engineering Coordination Wing)

28 Mauve Area, G-9/1, Islamabad
Phone No. 051-9032815, Fax No. 051-9104609

No.1(03 & 192)/GM(RAMD)/NHA/2026/257 Dated: 13th February 2026

The General Manager (Sindh-North)
National Highway Authority
Sukkur

Subject: ***REHABILITATION OF GUDDU BARRAGE CONTRACT PACKAGE-SBIP.G2 PROJECT***
REPLACEMENT OF LEFT PACAJKGE GATES OF GUDDU BARRAGE DURING CLOSURE PERIOD IN APRIL 2026

Reference: Your office diary No.611 dated 23rd January 2026.

It is to inform that Member (Engg. Coord) has been pleased to accord Provisional "No Objection Certificate (NOC)" in favour of **Project Management Office (PMO), Sindh Barrages Improvement Project (SBIP) Irrigation Department** for Construction of Diversion Channel and Excavation of Kashmore Road for alternate traffic diversion at Km 13 -14 on N-20 (RD 1+400) for three months subject to fulfillment of the following conditions and pre-requisites:

- The Irrigation Department shall fully restore the NHA Right of Way (ROW) and pavement to its original condition upon completion of the activity, at their own cost.
- A comprehensive Traffic Management Plan (TMP) shall be prepared and implemented during the construction/diversion works to ensure uninterrupted and safe traffic flow along N-20.
- The work shall be carried out under the supervision of NHA field staff in coordination with the Maintenance and Construction Wing of NHA Sukkur Region.
- Proper safety barricades, signage, and lighting arrangements shall be ensured by the executing agency at the worksite to avoid accidents and public inconvenience.
- NHA shall bear no financial responsibility or liability of any nature arising out of the activities carried out by the Irrigation Department.
- The executing agency shall ensure full compliance with environmental, safety, and legal requirements as per existing laws and NHA guidelines.
- The Irrigation Department shall submit a completion and restoration report duly endorsed by NHA field staff upon conclusion of works.

2. The case file in original is enclosed herewith for your information, record and further necessary action, please.

(AFTAB ULLAH BABAR)
General Manager (RAMD)

Copy for:
- Member (Engg. Coord) NHA HQ, Islamabad
- Member (South Zone) NHA, Karachi.
- G.M(Maint) Sindh-North NHA, Sukkur.
- SPS to Chairman NHA, Islamabad
- File

(Case file in original is enclosed)

A.4 Consultations with other stakeholders

13th January 2026

Attendees: Deputy Chief Engineer Sui Northern Gas Pipeline Ltd. Transmission, PMO, the Contractor and PIC.

Agenda: Gas pipeline protection

Findings: The requirement for the silt excluder works was explained by the project team to the participants. The team briefed on the channel required, which crosses the existing gas pipeline. Discussions were held regarding the pipeline protection methods.

Records:

January 2026

Attendees: Deputy General Manager Sui Northern Gas Pipeline Ltd. Transmission, PMO, Contractor and PIC.

Agenda: Gas pipeline protection

Findings: The detailed meeting was held with Deputy General Manager (Mr. Muhammad Yousif) of Sui Gas at Rahimyarkhan regarding diversion of channel for supply water to Ghotki Feeder Canal. The request was made for NOC and protecting Gas pipeline where from diversion channel to be constructed.

4th February 2026

Attendees: DCE, DCE, SE and Technical Officer of Sui Northern Gas Pipeline Ltd, the Contractor.

Agenda: Gas pipeline protection

Findings: The Contractor's advisor briefed the SNGPL officials regarding the proposed diversion works, crossing the ROW of the 24" and 30" diameter pipelines. Detailed discussions were held on the required protection measures. The final details were agreed, covering; pipeline supports (including those to resist uplift), rip rap protection, protective netting for debris, full restoration works, limitation on depth for heavy machinery passing, and presence of SNGPL during the works.

January 2026

Attendees: Districts' Management of Kashmore and Ghotki, PMO, PIC and the Contractor

Findings: Meeting with the Districts' Management of Kashmore and Ghotki. The team briefed about construction of diversion channel for supplying water to Ghotki feeder canal. Discussions were held about the construction diversion of traffic and traffic management plan and cutting road.

January 2026

Attendees: PTCL General Manager, PMO, PIC and Contractor.

Findings: PMO, PIC and the Contractor held meeting with General Manager (Mr. Aijaz Ali) and briefed him about construction of diversion of channel to supply water to Ghotki Feeder regarding protection of Optical Fiber. It was agreed that protection measures are required.

February 2026

Attendees: SEPCO, PMO, PIC and the Contractor.

Findings: The project team held meeting with Azim Abassi (SEPCO) and discussed on construction of diversion of channel to supply water to Ghotki Feeder. SEPCO were requested to support in the raising of 11 KV line crossing the works, in which they obliged accordingly.

11th February 2026

Attendees: ASP Kashmore (Mr Noman), PMO and PIC.

Findings: PMO briefed the representatives of ASP Kashmore on the works, including the road diversion. The traffic management measures were discussed and noted. ASP confirmed that they will give full cooperation for the works. The security of laborers of the contractor of the Guddu Barrage was discussed. In same way ASP ensured that District Police of Kashmore city has always provide the full proof security to the contractor and its staff. Further ASP police ensure that they will share the extended annual closure of the Ghotki canal with stakeholders, community and farmers in their own way.

Date	Organization	Designation
22 October 2025	Ghotki Area Water Board	Director GAWB. Members of AWB, FOs, Representatives of industrial Sector, Local Community
18 February 2026	Ghotki Area Water Board	Director GAWB
10 February 2026	Engro Fertiliser Company	Public Affairs Manager
08 October 2025	Village Giddu Khan	Various[3]
15 January 2026	Village Arzi Khan	Various
12 February 2026	Village Arzi Khan	Various
13 February 2026	Village Qabool Waghor	Various
13 February 2026	Village Sher Jan Mazari	Various
13 February 2026	Village Abdul Ghani Jatoi	Various
11 February 2026	HANDS NGO	Project Manager
15 January 2026	NHA	Director at Sukkur
13 January 2026	Sui Northern Gas Pipeline Ltd	Deputy Chief Engineer
January 2026	Sui Northern Gas Pipeline Ltd	Deputy General Manager
04 February 2026	Sui Northern Gas Pipeline Ltd	DCE, SE and Technical Officer
January 2026	Districts' Management of Kashmore & Ghotki	Additional Deputy Commissioner Ghotki
January 2026	PTCL	General Manager
February 2026	SEPCO	Executive Engineer
11 February 2026	ASP Kashmore	ASP Kashmore

[3] copies of attendance are attached against each consultation.

Annexure B – Contents of Existing CESMP

The existing CESMP developed for the G2 works includes the following sub-plans as stipulated in the specification:

- Organizational Framework
- Construction Camp Management Plan
- Traffic Management Plan
- Erosion, Sediment and Drainage Control Plan
- Pollution Prevention and Control Plan
- Waste Disposal and Effluent Management Plan
- Borrow Area Management and Restoration Plan
- Protection of Gas Pipeline Plan
- Drinking Water Supply and Sanitation Plan
- Management Plan for Protection of Flora and Fauna
- Fuel and Hazardous Substances Management Plan
- Instream Construction Works Management Plan
- Emergency Plan
- Training Plan
- Monitoring Plan
- Communication and Local Recruitment Plan
- Security Plan

Annexure C – Ghotki Flowrate

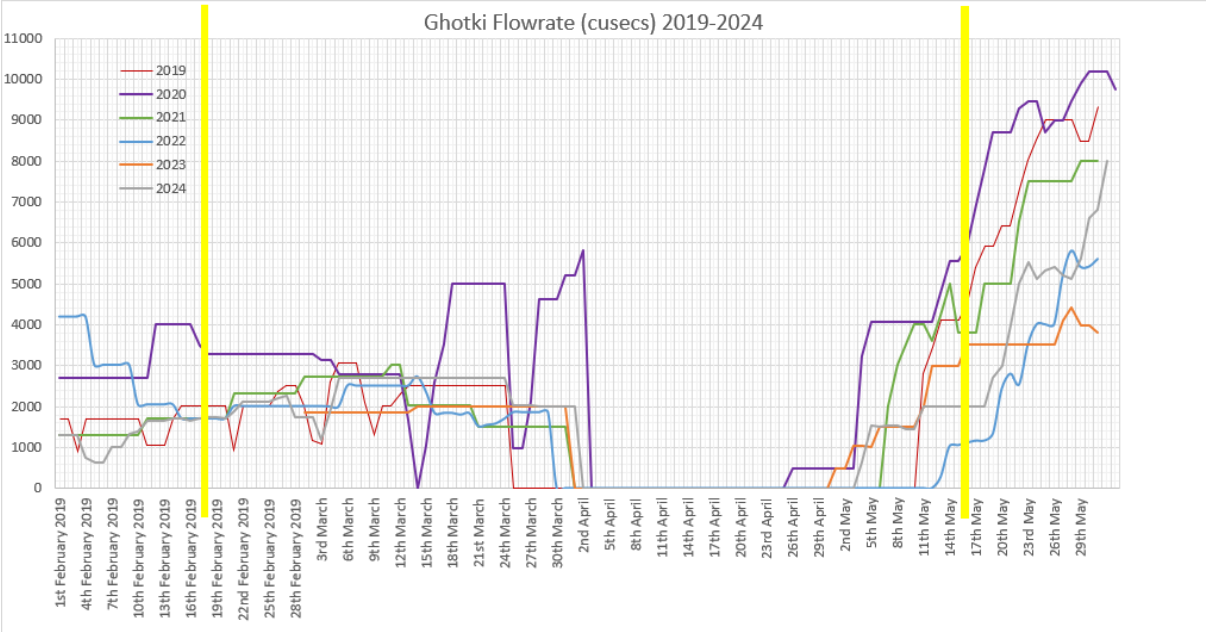


Figure C.1: Records of Ghotki flowrate (cusecs) 2019-2024

Annexure D – Alternatives to Silt Excluder Removal

Table D.1: Comparison of silt excluder options (advantages and disadvantages are noted with '+/-)

Option	Construction Program	Cost for silt excluder	Constructability	Silt Management	Future Maintenance
1. Fully remove top slab and side walls	- Longest program, requires extended closure period for gate replacement and removal of silt excluder.	- Most significant works hence highest cost, not presently part of the scope of the SBIP project.	+ Full removal may be more straightforward than partial. - Potential risk to existing barrage apron (although mitigations may be possible). - Various activities being undertaken in parallel in close quarters.	+ May have benefit in reducing silt concentration in the canals in certain scenarios.	+ Allows for future maintenance of pocket gates using bulkhead gates, extending the service life of the barrage gates.
2. Partially remove - top slab and partial side walls	+ Shorter program, requires extended closure period for gate replacement and partial removal of silt excluder.	- Additional cost, not presently part of the scope of the SBIP project.	- Various activities being undertaken in parallel in close quarters.	+/- Unknown impact.	+ Allows for future maintenance of pocket gates using bulkhead gates, extending the service life of the barrage gates.
3. Leave in place	+ Shorter program, requires extended closure period for gate replacement.	+ No additional costs (above the gate replacement works using cofferdams).	+ No significant works on silt excluder or existing structure. Some localized works will likely be required given the proximity of the silt excluder to the gates.	+/- No change to the current scenario.	- Does not allow for future gate maintenance by dewatering of the left pocket bays using bulkhead gates.