Table 4-1. Key Historical Background Findings for Deir Ammar Power Plant

Aspect	Summary of Key Issues
Geographical location documented by historical Google maps	Layout and components + Google Earth historical images until oldest available in 2004 + Google Earth KMZ file showing boundary and offshore structures as provided by facility in **Appendix A1.**
Start and end of construction dates	1995 – 1998
Financing the construction and installations and main contractor(s)/suppliers involved	Financing by SAN PAOLO IMI (EX CREDIOP), COMMERZBANK, PARIBAS, FADES, and others 1995 – 1998: EPC by Ansaldo (Italian) and Siemens (German) 1998 – 2000: O&M by Ansaldo (Italian) 2000 – 2002 : O&M by ENEL (Italian) 2002 – Feb 2006: O&M by EDL[5] Lebanese Subcontractor PSM (Poor experience with contract model) Feb 2006 – Feb 2011: O&M by KEPCO (Korean) Feb 2011 – Feb 2016: O&M by YTL (Malaysian) Feb 2016 – Feb 2021: O&M by Primesouth (American) Feb 2021 – Feb 2022: O&M by Primesouth (American) Feb 2022 – Feb 2027: O&M contract renewal negotiations with Primesouth being undertaken
Any legacy issues concerning environmental aspects, land ownership, social and community issues, etc.6	- Pending Al Dohaibi Claim against EDL for compensation for lost trees in PP area when PP was constructed in 1995 is following legal course. - Public complaint regarding petroleum spill at sea in 2018; this issue has had no legal or publicity follow-up. - Public complaint and demand letter for financial compensation (LBP 1 Billion) by family lawyer regarding army member who drowned while spearfishing opposite the facility, which was attributed to suction flow from the inlet pipe (**Appendix A2**). Case has not gone to court yet as communicated by EDL.
Historical land use of the facility site and surroundings (supported by maps)	Initially owned by Iraqi Petroleum Company and Mediterranean Sea Pipeline Company Limited then nationalized by GoL[7] in 1973 and ownership transferred to EDL – MEW **(Appendix A2)**. Prior to construction of the Power Plant, the land comprised a golf court for LOI[8] from the 1950's until construction of the PP in 1995.

Table 4-2. Key ESS Findings, and {Corrective Actions and Timeline} for Deir Ammar Power Plant

ESS Key Issues	Non Compliance Risk	Corrective Actions	Timeline
ESS1: Assessment and management of Environmental and Social Risks and Impacts ***Permits Licenses, Management and Monitoring Systems***			
Deir Ammar Power Plant lacks an Environmental Audit and ESMP based on local regulations and has non-compliances in terms of its emissions and effluent discharges to the sea.	Substantial	Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MOE and WB.	Prior to Operation on NG
Environmental and social aspects and potential adverse impacts are not explicitly managed.	Substantial	Environmental, OHS and Social aspect shall be covered in dedicated procedures covering environmental and social risks, KPIs, monitoring requirements, reporting, evaluation, and corrective measures. A GRM for employees and FGRM for the general public need to be developed with facilitated 2-way communication mechanisms.	Prior to Operation on NG
Environmental and social aspects and potential adverse impacts are not explicitly managed.	Substantial	Environmental, OHS and Social aspect shall be covered in dedicated procedures covering environmental and social risks, KPIs, monitoring requirements, reporting, evaluation, and corrective measures. A GRM for employees and FGRM for the general public need to be developed with facilitated 2-way communication mechanisms.	Prior to Operation on NG
Environmental and social aspects and potential adverse impacts are not explicitly managed.	Substantial	Environmental, OHS and Social aspect shall be covered in dedicated procedures covering environmental and social risks, KPIs, monitoring requirements, reporting, evaluation, and corrective measures. A GRM for employees and FGRM for the general public need to be developed with facilitated 2-way communication mechanisms.	Prior to Operation on NG
Deir Ammar Power Plant lacks an Environmental Audit and ESMP based on local regulations and has non-compliances in terms of its emissions and effluent discharges to the sea. Mixing zone shall be defined for cooling water discharge and monitored particularly for chlorine and temperature; compliance is based on effluent temperature being less than 35°C in national standards and temperature differential of less than 3°C at edge of mixing zone in WB standards while Chlorine should be less than 1 mg/l.	Substantial	Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MOE and WB.	Prior to Operation on NG
Deir Ammar Power Plant lacks an Environmental Audit and ESMP based on local regulations and likely has non-compliances in terms of its emissions and effluent discharges to the sea.	Substantial	Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MOE and WB	Prior to Operation on NG
Deir Ammar Power Plant lacks an Environmental Audit and ESMP based on local regulations and has non-compliances in terms of its emissions and effluent discharges to the sea. Compliance with environmental emission standards requires a third party audit with measurements for the different types of emissions followed up by yearly audits and inspections by MoE or a third party consultant on behalf of MoE; it is also important that both EDL and the operator commit to compliance and allocate the necessary funds accordingly, which would not be expensive in the case of the PP operating on natural gas.	Substantial	Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MoE and WB.	Prior to Operation on NG

[5] Electricite du Liban

[6] This may require consultations and interviews with surrounding communities and local NGOs.

[7] Government of Lebanon

[8] Lebanon Oil Installations

ESS Key Issues	Non Compliance Risk	Corrective Actions	Timeline
- The power plant has safety requirements in its design based on international standards and is according to EDL in compliance with the national requirements prevalent at the time of construction. Construction permits could not be obtained for review because EDL reported that the hard copies stored at EDL HQ in Beirut may have been lost during Beirut Port Blast. - While the risk of fire is covered in the current emergency response plan and while the risks of floods and severe weather conditions are not pertinent in the case of the PP, the risk of a major earthquake that exceeds the earthquake resistance parameters of the PP is real (a scientific research[17] had recommended in 2011 post PP construction that the seismic hazard for the coastal region of Lebanon be raised to account for at least 0.3g Peak Ground Acceleration). Tsunamis also occurred historically in Lebanon as a result of large seismic events.	Substantial	The current Emergency Response and Preparedness Procedure shall account for the increased seismic hazard to the PP and associated Tsunami risk, and coordinate with external parties (e.g., civil defense, fire brigade, emergency services) as relevant to the safety of PP personnel, the general public, and the environment.	Prior to Operation on NG
- Deir Ammar Power Plant lacks an Environmental Audit and ESMP based on local regulations and has non-compliances in terms of its emissions and effluent discharges to the sea. - Environmental and social aspects and potential adverse impacts are not explicitly managed. - Air emissions are not continuously monitored because the available CEMS is not being used for such a purpose and additional parameters not measured by CEMS (Particulate Matter) are not also being monitored. - A cooling water return flow mixing zone was never established and temperature of cooling water return flow is not being monitored. - Due diligence on oily sludge transporters must be conducted to ensure they are properly licensed in accordance with Decree 999/1 of 2020.	Substantial	- Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MoE and WB. - Environmental, OHS and Social aspect shall be covered in dedicated procedures covering environmental and social risks, KPIs, monitoring requirements, reporting, evaluation, and corrective measures. A GRM for employees and FGRM for the general public need to be developed with facilitated 2-way communication mechanisms.	Prior to Operation on NG
Environmental and social aspect compliance and improvement responsibilities are lacking from HSE Manager responsibilities.	Substantial	Environmental and social aspect compliance and improvement responsibilities shall be added to HSE Manager responsibilities in addition to developing and implementing a training so that HSE manager can deliver on these responsibilities. Alternative would be to hire a dedicated environmental manager. An external consultant shall be contracted to ensure E&S compliance and provide training to the HSE manager and develop the needed E&S procedures including roles and responsibilities.	Prior to Operation on NG
HSE Manager is a safety engineer with no relevant training or background in environmental affairs.	Substantial	Environmental and social aspect compliance and improvement responsibilities shall be added to HSE Manager responsibilities in addition to developing and implementing a training so that HSE manager can deliver on these responsibilities. Alternative would be to hire a dedicated environmental manager. An external consultant shall be contracted to ensure E&S compliance and provide training to the HSE manager and develop the needed E&S procedures including roles and responsibilities.	Prior to Operation on NG
Roles and Responsibilities procedure covering environmental and social aspects is lacking.	Substantial	Environmental and social aspect compliance and improvement responsibilities shall be added to HSE Manager responsibilities in addition to developing and implementing a training so that HSE manager can deliver on these responsibilities. Alternative would be to hire a dedicated environmental manager. An external consultant shall be contracted to ensure E&S compliance and provide training to the HSE manager and develop the needed E&S procedures including roles and responsibilities.	Prior to Operation on NG
No reporting on environmental and social aspects is occurring.	Substantial	Standardized and regular reporting on environmental and social aspects shall be created and added to monthly reports and quarterly audit reports.	Prior to Operation on NG
ESS2: Labor and Working Conditions			
There is no GRM for staff and no associated records apart from the code of conduct warning against discrimination and harassment and referring staff to the Assistant General Manager in such cases.	Moderate	A GRM including logs and explicit measures covering SEA/SH shall be added, and roles and responsibilities shall be assigned to competent staff with training provided.	Prior to Operation on NG
Emergency preparedness plans do not cover environmental risks except indirectly through safety.	Substantial	Pertinent environmental risks shall be identified following an environmental audit (refer to ESS1-1) and emergency preparedness and response plans shall be updated as needed.	Prior to Operation on NG
There was no safety induction provided to visitors.	Moderate	A standard safety induction shall be created and provided to all non-regular visitors.	Prior to Operation on NG
ESS3 (Resource Efficiency and Pollution Prevention and Management)			
Water Efficiency Upon switching to gas, the desalination plant capacity may become underused and the spare capacity (> 90 m^3/hr.) shall be evaluated by MEW for potentially relieving water shortage in the coastal area of Mineh-Danniyeh as a last resort. This should occur in the future after current demand mismanagement and Unaccounted For Water, have been resolved first and the potential for sustainably conveying water from adjacent water basins or mountainous regions with a positive water balance has been assessed. Increased seawater desalination has adverse impacts on the marine environment and should be a last resort. Increased desalination will also consume power that should be accounted for along with its potential impacts.	Negligible	No action required except for assessing the potential use of spare desalination capacity for relieving water shortage for neighboring communities, which should only be a last resort after reducing unaccounted for water percentage to below 30% and options for sustainably diverting freshwater for mountainous areas with a positive water balance (consistently with a regional water supply strategy and phased plan over at least 15 years in the future) have been exhausted.	
Wastewater Management Wastewater effluent discharges from the PP are not adequately monitored to ensure and/or prove compliance with local discharge standards.	Substantial	Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MOE and WB.	Prior to Operation on NG

ESS Key Issues	Non Compliance Risk	Corrective Actions	Timeline
Spill control and management Hazardous liquid chemicals are not contained and the storage of hazardous chemicals has not accounted for incompatible chemical neighbors.	Substantial	The safety audits shall account for incompatible chemical neighbors and all liquid receptacles shall be contained.	Prior to Operation on NG
Waste Management Municipal solid waste is not being sorted and the contractor collecting the waste may be improperly disposing of waste through unsafe dumping and unsafe handling by vulnerable individuals. Hazardous oily sludge from the oil-water separator burnt as HFO at Jiyeh Power Plant may be incompatible with the incineration process resulting in non-compliant emissions.	Substantial	Develop a solid waste management plan for the facility.	Prior to Operation on NG
Violations, fines, and complaints Ministry of environment is yet to answer on any violations or complaints recorded against the PP. An individual claim by Ibrahim al Dohaibi is reported against EDL on the basis that the individual lost trees in the same land where the plant was built based on a concession provided to him by the previous owner of the land (IPC). A community complaint against the PP was raised when a swimmer lost his life while diving because he was sucked by the cooling water intake pipe. Al Rawda school that was identified as a potentially affected party and contacted because it is located not far from the PP has reported having concerns from vibrations caused by the operation of the PP.	Moderate	The restricted area of the intake pipe and/or the intake pipe extension at sea shall be delineated with visible buoys and floating rope.	Prior to Operation on NG
Air pollution and greenhouse Gases The available CEMS at the facility is not be operated except for taking discrete measurements. In a 2018 stack test following rehabilitation works, NOx measurements showed noncompliance with MoE Decision 8/1 ELVs.	Substantial	The CEMS shall be operated continuously (or at least one operational day per week) for measurements and compliance; calibration shall occur as per manufacturer guidance. In addition, one yearly stack emissions test by an independent third party shall be conducted.	Prior to Operation on NG
Air emissions monitoring parameters and key performance indicators The available CEMS at the facility is not be operated except for taking discrete measurements. In a 2018 stack test following rehabilitation works, NOx measurements showed noncompliance with MoE Decision 8/1 ELVs.	Substantial	The CEMS shall be operated continuously (or at least one operational day per week) for measurements and compliance; calibration shall occur as per manufacturer guidance. In addition, one yearly stack emissions test by an independent third party shall be conducted.	Prior to Operation on NG
ESS4 (Community health and Safety)			
A code of conduct specific to security personnel was not observed.	Moderate	Code of conduct for security personnel must be explicitly defined, they should sign off on it, and they should be trained on the proper response in case of interaction with the community.	Prior to Operation on NG
There is no FGRM for the general public. The facility does not accept direct claims or complaints from the surrounding communities and refers them to formally communicate with the EDL HQ in Beirut.	Substantial	An FGRM shall be created and implemented to facilitate feedback, claims, and complaints from the general public; it will be widely disseminated with information on the resolution timelines, responsible persons, and option for appeals. Referral pathways for SEA/SH shall be established and communicated.	Prior to Operation on NG
ESS5 (Land Acquisition, restrictions on Land use and Involuntary resettlement) No Key Issues			
ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources)			
Monitoring and analysis of water quality and temperature within and at edge of mixing zone (to be defined) from PP discharges are lacking.	Moderate	Monitoring and analysis of water quality and temperature within and at edge of mixing zone (to be defined) from PP discharges shall be performed.	Prior to Operation on NG and to be continued afterward.
Deir Ammar Power Plant lacks an Environmental Audit and ESMP based on local regulations and likely has non-compliances in terms of its emissions and effluent discharges to the sea.	Moderate	Deir Ammar Power Plant requires an Environmental Audit based on national regulations including environmental measurements for emissions, wastewater discharges, and noise and vibrations inside facility and at nearby sensitive receptors. Based on audit results, corrective actions and an adequate monitoring program shall be proposed and committed to as part of an ESMP approved by MOE and WB.	Prior to Operation on NG and to be continued afterward.
ESS8 (Cultural heritage) **No Key Issues**			
ESS10 (Stakeholder Engagement and Information Disclosure)			
There is no FGRM for the general public. The facility does not accept direct claims or complaints from the surrounding communities and refers them to formally communicate with the EDL HQ in Beirut.	Substantial	An FGRM shall be created and implemented to facilitate feedback, claims, and complaints from the general public; it will be widely disseminated with information on the resolution timelines, responsible persons, and option for appeals. Referral pathways for SEA/SH shall be established and communicated.	Prior to Operation on NG

Table 4-3. Key Historical Background Findings for Arab Gas Pipeline

Aspect	Summary of Key Issues
Geographical location documented by historical Google maps for PRS and Metering Station	- Approximate boundaries of Receiving Station, Pressure Reducing Station (PRS), and Border Station are shown **Appendix B1**. - Receiving Station is located within Tripoli Oil Installations – Lebanon (TOIL) owned premises in Beddawi Village, Minieh-Danniye Caza, and North Lebanon Governorate. - PRS is located within Electricité Du Liban (EDL) owned Deir Ammar Power Plant premises but under LOI ownership and jurisdiction, in Beddawi Village, Minieh-Danniye Caza, North Lebanon Governorate. - Border Station is located within LOI owned land adjacent to Lebanon-Syria border along el Kebir River in Hokr Jouret Srar village, Akkar Caza and Governorate.
Routing	Refer to **Appendix B2**
Start and end of construction dates	2003-2005
Financing the construction and installations and main contractor(s)/suppliers involved	Financing was secured by LOI according to MEW Contractor: Hawi Bros Contracting and Trading Consultant: Kershner Owner: Tripoli Oil Installations Lebanon
Any legacy issues concerning environmental aspects, land ownership, social and community issues, etc.[9]	- Land ownership: Historically owned from 1931 to 1973 by Iraq Petroleum Company (IPC) and Mediterranean Sea Pipeline Company until nationalized in 1973 by the Government of Lebanon (GoL) following nationalization of these companies in 1961-1972 by the Iraqi Government and failing to fulfill their contractual obligation in Lebanon; their ownership was later transferred to the Ministry of Energy and Water (MEW) – Lebanon Oil Installations in 1970s (**Appendix B3**). - Environmental: Mainly oil spills from adjacent crude pipelines within 32 km Right-of-Way (ROW) resulting from deterioration of pipeline and from theft attempts whereby the pipes are perforated and crude pumped out (refer to photo in **Appendix B4** showing punctured pipe location and stained soil where pipe is exposed within stream and welded by Tripoli Oil Installations - Lebanon (TOIL) after being repeatedly punctured for theft of crude). - Relatively recently, the gas pipeline, which is still pressurized at 5 bars to protect it from corrosion, was punctured by individuals trying to steel crude oil from adjacent crude oil pipelines within the same ROW; TOIL staff reported witnessing a small drop in pressure in the control room and they were alerted to the location of the hole by locals who heard the whistling sound of gas escaping. The emergency shutdown and flaring system was not triggered because of the low pressure maintained and small size of the hole and gas leak. - Social and Community: Mostly after pipeline stopped operating in 2010, locals have been recurrently trespassing on the ROW reserved for crude oil pipes and the gas pipeline while being repeatedly asked to stop their trespassing activities for their safety. In the case of some more explicit constructions, security forces were brought in to remove trespassers and secure the integrity of the ROW. Main types of encroachment activities that still exist include agriculture and plowing of the ROW, backyards extending into ROW, using the ROW as road access, for parking cars and trailers, and as miscellaneous outdoor storage areas or dumps (**Appendix B4**). - The gas pipeline trace and ROW were visited in certain portions along its length to observe it within different land uses (agricultural, rural, urban, under paved roads, and across streams and rivers); it was observed that the previously built gravel road allowing continuous maintenance and emergency access along the whole extent of the gas pipeline and ROW has been particularly eroded along agricultural terrains because local farmers use it for easier access with their tractors (Refer to Figure showing lad use / cover crossed by ROW).
Historical land use of the facility site and surroundings (supported by maps) for PRS and Metering Station	- The PRS location is located on an artificially cut hill side, likely to make room for the station. The rest of the hill side, remains bare land until today with the exception of shrubs; this suggests that the PRS location was historically similar. - The Metering Station is located within TOIL premises; it consisted of bare land and reeds according to the contractor who built the pipeline (S. Hawi, Personal Communication, November 17, 2021).

Table 4-4. Key ESS Findings, and {Corrective Actions and Timeline} for Arab Gas Pipeline

ESS Key Issues	Non-Compliance Risk (Low, Moderate, Substantial, High)	Corrective Actions	Timeline
ESS1: Assessment and management of Environmental and Social Risks and Impacts ***Permits Licenses, Management and Monitoring Systems***			
While an ESIA is not required for the pipeline and linked facilities because they were built before an the EIA decree was enforced (2012), the lack of it means there are no systems and no management plan in place to manage environmental and social risks associated with the operation of the pipeline and associated facilities.	Substantial	An Environmental and Social Management Plan for the pipeline and linked facilities shall be prepared. Refer also to ESS1-3	Prior to Operation
TOIL do not have any management system certification.	Moderate	Refer to ESS1-3 to offset the lack of a certified management System.	Prior to Operation
TGS are ISO 14001:2015, ISO 45001:2018, ISO 9001:2015 certified and their management system and manual covers EHS albeit with some social aspect deficiencies. TOIL lack the required management system and manual as well as the associated competencies.	Substantial	TGS shall introduce the necessary social aspect procedures in their EHS manual including social aspects and FGRM, communication mechanisms and protocols, and communication strategy with local communities. The owner of EHS risks shall be clearly defined (TGS and/or TOIL) the manual must cover all foreseeable EHS and social risks. Where there are risks owned by TOIL, they will develop a manual with the help of a qualified consultant including Social Management System (ESMS) to manage these risks. The manual shall also be updated based on the results of additional safety and risk assessment studies to be conducted. If it is decided that TOIL are in fully in charge of the ESMS, then one will developed for them by a qualified consultant and it shall cover TGS and all relevant stakeholder risks; they will also be trained on it and they will hire/train competent staff capable of implementing it (EHS Manager and Officer(s)).	Prior to Operation
- TOIL lack environmental and social monitoring. - TGS have environmental and social monitoring albeit with some social aspect gaps.	Substantial	TGS need to add social monitoring records in line with ESS1-3	Prior to Operation

[9] This may require consultations and interviews with surrounding communities and local NGOs.

ESS Key Issues	Non-Compliance Risk (Low, Moderate, Substantial, High)	Corrective Actions	Timeline
TGS have mainly environmental reviews and action trackers; social aspects are mostly lacking.	Substantial	TGS need to add social reviews and trackers in line with ESS1-3 and ESS3-4	Prior to Operation
- Receiving Station has an underground cesspool that is designed to infiltrate into the ground, which is a noncompliance with local legislation that mandates impermeable septic tanks if no connection to sewerage system is available. - It could not be confirmed if toilet facility at border station is connected to sewer main.	Moderate	Recommendation is to either construct a sewerage connection to closest sewer main if such a network is connected to a functional sewage treatment plant with secondary treatment or to install an impermeable septic tank and regularly empty it and transport it to a nearby treatment plant – the secondary treatment plant present within Power Plant with 1.5 m^3/hr. and 3 m^3/hr. average and peak capacities respectively should be able to easily accommodate the 0.5-1 m^3 per day of sewage generated assuming 10 individuals at the Receiving Station. It is recommended to confirm that the toilet facility at the border station is connected to a sewerage main.	Within 12 months after start of operation
Key environmental legislation regulating environmental aspects and emissions pertaining to air quality, noise, waste, effluent discharge, and chemical and hazardous material are summarized in Section 3.2.2. These national regulations offer sufficient environmental protection if implemented and enforced.	Low	EHS management shall identify all applicable environmental standards and legal requirements in its environmental aspects register and it shall ensure they are compliant with national legislation where applicable.	Prior to rehabilitation and operation phases
- Gas pipeline was built based on international engineering standards; however, vulnerability to earthquake prone Lebanon has not been characterized and neither appropriate response plans. - Seismic risk characterization for control rooms and automatic shutdown and flaring systems at Receiving Station, PRS, and Border Station is lacking	Moderate	Assess seismic risk as part of the risk assessment planned for the pipeline (refer to Section ESS5-1) and develop the appropriate emergency response plan with the involvement of other authorities (e.g., civil defense, fire brigade, security forces, paramedics) in addition to a training schedule and drills.	Prior to operation
• **Environment and OHS** There are repairs to be made on pipeline and facilities because the pipeline has not been operational for more than a decade (refer to TGS repair assessment report); pipeline markers and berms need rehabilitation and there are general public activities encroaching on the pipeline and ROW. • **Community Health and Safety** There is no evidence of a quantitative risk assessment and a manual of permissible and non-permissible activities within ROW and safety separation distance (not defined as of yet) Given that the pipelines has not been in operation for a long time, it is critical to ensure that safety hazards including major accident hazards can be effectively managed through the existing barriers integrated in design, but also to ensure that operational barriers are in place, and consider maintenance activities • **Performance Indicators and Monitoring** TGS will cover needed aspects	Substantial	• Environment and OHS Damages to pipeline and facilities shall be repaired and measures such as increased pipeline markers and restoration of the pipeline berm shall be undertaken. A stand-alone Occupational Hazards Management Plan shall be prepared. • Community Health and Safety - The following risk and safety studies need to be prepared to confirm readiness to operate the gas pipeline system and associated facilities safely (in line with the World Bank's latest EHS guidelines for oil and gas facilities): HAZID, Hazardous Area Classification, Safety Case, Quantitative Risk Assessment (QRA), Fire and explosion analysis, SIMOPS (Simultaneous Operations since the gas pipeline is in a common corridor), MOPO (Manual of Permitted Operations), ALARP demonstration, LOPA (Layer of Protection Analysis) and Asset integrity Management; it is recommended that this studies be conducted by an independent party commissioned by TGS as part of its preparatory activities and repair works; the recommended risk studies are based on international standards and best practice in the sector - The assessments will inform the preparation of an ROW management plan including permissible and non-permissible activities on the ROW and the safety buffer area as identified by the risk studies - An explicit communication and awareness campaign is required as part of a SEP to inform and sensitize the public on the risks of gas pipelines, on its direct financial benefits in terms of increased power supply and associated cost reduction to them, Environmental and Social benefits. Information dissemination on the risks associated with vandalism of the gas pipeline and structure as well as from the adjacent crude oil pipelines is also important. - Signage shall clearly indicate an abbreviated phone number to use for reporting leaks or vandalism to the gas pipeline or adjacent crude oil ones. - A very clear and enforceable communication protocol between the operator, owner, authorities (civil defense, paramedics, the army, and internal security forces on the one hand and the general public and the press on the other shall be defined and implemented to avoid misinformation and confusion; this will anyway be needed in emergency management. Incentives such as rewards for reporting leaks and vandalism may be considered conditional to not conflicting with cultural and ethical norms. - Means to access pertinent information at any time shall be advertised for the general public so that they can directly obtain information following an incident or accident thus avoiding misinformation from anecdotal information.	Prior to Operation
TGS advised that they will dispatch and hire an EHS team including EHS Manager/Officer for AGP-Lebanon once they are commissioned its O&M.	Substantial	The Operator will dispatch / hire a competent EHS team including EHS Manager / Officer.	Prior to rehabilitation and operation
TGS advised that they will dispatch and hire a competent EHS team including EHS Manager/Officer.	Substantial	The Operator will dispatch / hire a competent EHS team including EHS Manager / Officer.	Prior to rehabilitation and operation
Environmental and Social roles and responsibilities are integral to TGS being ISO 14001 certified and TGS informed that all necessary documentation and records will be maintained once they are commissioned the O&M of AGP-Lebanon.	Substantial	All necessary documentation and records will be maintained by the Operator and Borrower upon commissioning the O&M of AGP-Lebanon.	Prior to rehabilitation and operation
The Operator will report to the Borrower in addition to WB as required (Examples of reporting in Appendix B7).	Substantial	The Operator will report to the Borrower in addition to WB as required	
ESS2: Labor and Working Conditions			

ESS Key Issues	Non-Compliance Risk (Low, Moderate, Substantial, High)	Corrective Actions	Timeline
A suitable EHS Management System covering OHS and COVID19 and managing all stakeholders including TOIL staff and sub-contractors should be put in place and implemented for Lebanon-AGP.	Substantial	A suitable EHS Management System covering OHS and COVID19 and managing all stakeholders including TOIL staff and sub-contractors shall be put in place and implemented for Lebanon-AGP.	
- AGP has not been functional for over a decade. It is recommended that if AGP TOIL team will have actual work as part of the TGS team and not just a supervisory role that they be fully responsible under TGS leadership given they have to be fully integrated in their O&M and EHS Management Systems. Responsibilities should not be lost or confused due to unclear authority and accountability between TGS and TOIL-MEW especially since one is a contractor and the other is the client while both have staff working on the project. - Neither AGP TOIL nor TGS have SEA/SH and GBV measures in place; those will need to be added in TGS' EHS Management System, all staff shall be trained on them, should sign a code of conduct covering them, and shall adhere to them and be regularly trained on them with all the necessary record keeping in place.	Substantial	Integrated AGP TOIL within TGS's EHS Management System to have an overarching EHSMS covering applicable risks with clear assignment of responsibilities and accountability. SEA/SH and GBV measures will be added in the EHSMS and adhered to by all concerned staff and as per the Labor Management Procedures prepared for the project; all staff shall be trained on them, should sign a code of conduct covering them, and shall adhere to them and be regularly trained on them with all the necessary record keeping in place.	Prior to Operation
Both AGP LOIL and TGS currently have emergency management plans while a revised unified one is expected for both rehabilitation and operation phases of AGP.	Low	Revised Emergency Management Plans covering all risks identified in the pre-rehabilitation risk assessment will be developed for both rehabilitation and operation phases of AGP.	Prior to rehabilitation and operation
The Receiving Station does not currently have an escape plan and procedure while keeping mind that the building is small with 2 exits that provide sufficient emergency egress.	Low	TGS will account for an escape plan and procedure for the Receiving Station and will familiarize staff working on the PRS with the PP's escape plan	Prior to Operation
ESS3: Resource Efficiency and Pollution Prevention and management			
Wastewater Management If conducted, hydrostatic testing of gas pipeline is not expected to generate wastewater exceeding discharge standards.	Low	TGS are expected to identify wastewater associated hazards and recommend appropriate monitoring prior to discharge and treatment if needed, including for hydrostatic testing if conducted.	Prior to Operation
Spill control and management Spills are only associated with existing generator diesel tanks present at Receiving Station and Border Station. Both these tanks are located above concrete pavement but are not bunded; spills can accordingly reach nearby soil **(Appendix B11).**	Moderate	Spill trays and bunding equivalent to at least 110% of the capacity of the tanks in addition to spill kits and the appropriate spill prevention and control procedure should be in place.	Prior to Operation
Waste Management - Municipal waste at the Receiving Station is currently being collected by the Beddawi municipality contractor – Lavajet. - The PRS at the Deir Ammar PP is not expected to generate solid waste. - Municipal waste at the Border Station will be minor given it is not expected to be continuously staffed except for the continuous presence of a security guard.	Low	The Operator will coordinate with Lavajet to secure bins for sorting at source at the Receiving Station (Control Room) and staff shall sort municipal solid waste generated.	Upon start of operation
Operational and Maintenance Program - TGS communicated that there are no major maintenance requirements for the gas distribution network once rehabilitated. - Spare part inventory will need to be managed either based on a software with threshold based notifications or a manual inventory schedule ensuring there is no risk of spare part shortage.	Low	Spare part inventory will be managed based on either a software with threshold based notifications or a manual inventory schedule ensuring there is no risk of spare part shortage.	Upon start of operation
Violations, fines, and complaints TOIL do not have an environmental register but TGS will develop one being the Operator.	Low	The Operator (TGS) will develop an environmental aspect for the project.	Prior to Rehabilitation and Operation
ESS4: Community health and Safety			
No evidence of Safety Distance has been observed nor a Manual of Permitted and Non-Permitted Activities within ROW and safety distance (to be defined). There seems to be no code of conduct for security personnel at present and this may need to be addressed in the EHS management system.	Substantial	Refer to ESS1-12 TGS and TOIL shall account for a code of conduct for security personnel.	Prior to Operation
TOIL premises can be occasionally accessed without being stopped. More stringent access control is recommended.	Substantial	More stringent access control is recommended to TOIL premises shall be enforced.	Immediate
An FGRM including SEA/SH is currently lacking.	Substantial	An FGRM including SEA/SH shall be developed for the AGP.	Prior to Operation
ESS5: Land Acquisition, restrictions on Land use and Involuntary resettlement			
- There are trespassing and encroachment of private individuals/entities on the ROW which hinder continued access along the ROW for O&M and thus expose encroachers and the general public to H&S risks. Encroachment includes agricultural activities, private backyard extension onto ROW, neighborhood road access, use of ROW as car and truck park space and as miscellaneous outdoor storage or dumps. - In case safety studies and separation distance do not trigger additional resettlement needs, impacts on livelihood are expected to be low if any. This is mainly because the encroachment of agricultural land is mainly from large agricultural fields and not small right holders.	Substantial	- Any compensation of encroaching parties shall be evaluated following a risk assessment for the gas pipeline within the ROW in terms of whether it is safe to allow encroaching parties to continue their activities or to require their removal for the sake of future integrity of the ROW and their own safety. At the moment the only activities that if removed, could lead to economic displacement are agricultural activities. Livelihood restoration measures would in this case apply. - What is not known at the moment is the safety distance from the pipeline as a result of a quantitative risk assessment, and once defined, what would be the impacts and associated requirements, if any, to relocate structures and activities. It is therefore recommended to conduct the following:	Prior to rehabilitation pipeline before operation

ESS Key Issues	Non-Compliance Risk (Low, Moderate, Substantial, High)	Corrective Actions	Timeline
- Main risk would be related to a wider separation distance, if required through safety studies, and which trigger further resettlement needs.		- A Resettlement Policy Framework consistent with ESS5 covering both economic and physical resettlement in case the latter is triggered by safety studies - Safety studies and workshops (HAZID, QRA, As Low As Reasonably Practicable (ALARP) study and workshop, and a Manual of Permitted Operations study and workshop (MOPO)) - Based on results of safety studies, identify affected persons and activities, types of impacts, prepare a detailed socio-economic survey, cadastral and asset census and determine a cut-off date for compensation based on date of completion of the census. - Preparation a Resettlement Action Plan (RAP) (or only a Livelihood Restoration Plan if physical resettlement is not triggered) - Implement the RAP/LRP	
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources **No Key Issues**			
ESS8: Cultural heritage **No Key Issues**			
ESS10: Stakeholder Engagement and Information Disclosure			
- A SEP is currently lacking but under preparation by the Ministry of Energy and Water which will be cleared by the World Bank and disclosed prior to the appraisal stage - Parties illegally encroaching on the existing ROW and gas pipeline path would need to be identified and characterized to also assess whether they fit the vulnerability criteria set by the Bank in case of resettlement or livelihood restoration need. - Impacts could arise in case safety studies indicate the need for a wider safety distance than ROW or special measures whenever gas pipeline crosses within urban centers; this needs to be confirmed once safety studies are completed; this safety assessment process has been initiated by MEW. - A GRM is currently lacking. - A communication strategy is currently lacking.	Substantial	- A SEP is currently lacking but under preparation by the Ministry of Energy and Water which will be cleared by the World Bank and disclosed prior to the appraisal stage. - An FGRM including SEA/SH shall be developed for the AGP as part of the EHS Management System prior to start of rehabilitation. - An explicit communication and awareness campaign is required as part of a SEP to inform and sensitize the public on the risks of gas pipelines, on its direct financial benefits in terms of increased power supply and associated cost reduction to them, Environmental and Social benefits. Information dissemination on the risks associated with vandalism of the gas pipeline and structure as well as from the adjacent crude oil pipelines is also important. - Signage shall clearly indicate an abbreviated phone number to use for reporting leaks or vandalism to the gas pipeline or adjacent crude oil ones. - A very clear and enforceable communication protocol between the operator, owner, authorities (civil defense, paramedics, the army, and internal security forces on the one hand and the general public and the press on the other shall be defined and implemented to avoid misinformation and confusion; this will anyway be needed in emergency management. Incentives such as rewards for reporting leaks and vandalism may be considered conditional to not conflicting with cultural and ethical norms. - Means to access pertinent information at any time shall be advertised for the general public so that they can directly obtain information following an incident or accident thus avoiding misinformation from anecdotal information. - A communication strategy shall be prepared.	Prior to Rehabilitation

5. STAKEHOLDER CONSULTATIONS

Initial stakeholder identification and consultation was conducted during the Environmental and Social Review phase during November / December 2021 followed by consultations with local communities on February 2, 2022 to present the SEP and obtain feedback from the local communities; categories and summary of responses are provided in Table 5-1. MEW will continue following-up with all stakeholders who have not responded or could not be reached as part of the due diligence/preparation phase and will engage with all stakeholders as part of the proposed SEP programme.

The most pertinent feedback is described below:

- Municipality of Beddawi indicated that a claim against air pollution from the Deir Amamr Power Plant was filed to MoE a few years back but the official claim could not be found (MoE has not responded yet). The municipality also indicated that a Lebanese army officer drowned because of the suction of the cooling water intake pipe; this happened on 19 September 2020 while spearfishing opposite the power plant.
- A principal of a school located 300 m approximately from the power plant noted that the school is affected by vibrations whenever the power plant is operational. The principal also noted that her balcony tiles were deteriorating because of acid rain.
- The fishermen cooperative in Tripoli indicated that fish stocks were declining but could not scientifically attribute that to the power plant; they are not sure if cooling water outflow into the sea has an adverse impact and they believe sewage is the most important problem in terms of sea pollution.
- Minieh Governmental Hospital referred to increased pulmonary diseases and cancer rates in the area while stating that a scientific study was needed to identify the reasons behind this increase.

In addition to the above, EDL revealed that there was a pending claim against EDL by an individual called Ibrahim al Dohaibi and that EDL had reached out to MEW for more information on this claim (the correspondence is dated 2018-2019 but the actual claim, which may go back to when the power plant was constructed in 1995 could not be obtained). The claim itself could not be obtained but it was understood that it was about compensation for trees lost based on a land use concession obtained by Mr. Al Dohaibi from the previous owner of the land where the power plant was built – Iraq Petroleum Company (IPC). EDL became the new owner of the land after IPC lands where the Deir Ammar Power Plant now stands were expropriated for the benefit of EDL.

The legal department of LOI, the current owner of the pipeline ROW, extending from the gas pipeline Receiving Station at TOIL until the Border Station was also contacted regarding encroachments on the pipeline ROW. LOI's legal department indicated that there are several claims filed by LOI against various parties who had encroached on the ROW and several of them led to the removal of the encroachments while some are still in process (LOI correspondence provided in the Environmental and Social Review (ESR) provides more details and examples on such encroachments).

Consultations with the local communities have also been undertaken on February 2nd, 2022 to discuss this SEP and the findings of the Environmental and Social Review (ESR). The consultations were conducted in the form of interviews with the municipalities and vulnerable groups located in the areas closest to the pipeline. The consultations were held in Minieh, Mhammar, Sammounyeh and Chir Hmairine as these villages have a relatively high population density around the pipeline's RoW and twenty one (21) people were interviewed in total. The vulnerable groups that participated in the consultation were mostly refugees and women.

During the consultation, interviewees were provided a brief background about the project and explained its benefits. Safety measures that are already put in place to ensure the gas pipeline's integrity were explained and it was explained that environmental, social and safety studies are being conducted to ensure that the project is environmental friendly, socially acceptable and safe.

The aim of the stakeholder engagement with vulnerable groups was to understand this group's concerns regarding the project and about the restrictions that could be implemented and to identify their preferred means to have access to important information. In addition, the municipalities were also interviewed to highlight key issues related to the use of the pipeline's RoW.

The following key questions were asked during the interviews to ensure that vulnerable groups in the area expressed their concerns, in order to consider their needs in the project:

1. For what purpose is the RoW used for, what are the main concerns on possible restrictions on the use of the RoW and what are the potential social impacts that exist from the possible restricted uses of the RoW.

2. What are the best ways to communicate those restrictions and any other project information.

3. What environmental, social, and safety concerns related to the project should be considered during the project operation.

4. What is the best way for them to send a grievance (uptake channel).

Table 5-2 summarizes the main findings of these consultations. Main points are summarized below:

- There is a generally positive attitude towards the project

- There are primarily agricultural activities that encroach on the pipeline; its relative extent compared to the total agricultural plot will need to be assessed during the ESMP, to assess whether restrictions to these lands, if required, would trigger significant impacts on livelihood; these are however mostly small patches of larger land and are not necessarily going to trigger important impacts on livelihood; communities do expect compensation in case restrictions affect their livelihoods

- No permanent structures on the ROW have been identified during the site visits and consultations, noting that the areas visited are the ones where human activities are the most dense

- No one really raised the issue of being too close to the pipeline; focus has been to require stringent safety measures to avoid a major accident; some of the consultees had actually witnessed the construction of the pipeline and felt re-assured by the professional work being undertaken

Table 5-1. Affected Parties Other than Borrower (MEW, EDL, LOI, TOIL) Contacted during E&S Review Phase

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
National Government			
Ministry of Environment (MoE)	Competent authority for Environmental Matters	Official letter signed by MEW Minister requesting: • Log of all historical complaints against Power Plant / Pipeline / Owner / Operator since design phase prior to inception • Copies of all correspondence with MoE since design phase • Copies of all inspection reports prepared by MoE • General and specific environmental monitoring requirements requested from Deir Ammar PP	No feedback received as of date of this report. Based on latest follow-up made on January 21, 2022, MoE is still collecting the information. MoE is significantly under-resourced at the moment and is not being able to efficiently respond to requests.
Ministry of Labor	Labor Authority – OHS aspects and labor conditions	Official letter signed by MEW Minister requesting: • Copies of labor related complaints • Records of labor or OHS related inspections conducted by MoL	MoL replied officially stating that there are no records of complaints and grievances against Power Plant and AGP.
Civil Defense	Fire history	Official letter signed by MEW Minister requesting: Log and report copies of all historical fires	Civil defense replied reporting one fire incident near the pipeline in Aabdeh on 14 Nov 2020 at 9:35 am because of nearby crude oil pipeline. An investigation was launched and a technical report was submitted at the time: The fire's likely cause was a cigarette butt thrown on the side of the road, and the fire spread to reach a small

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
			oil spill from the decaying and corroded crude oil pipeline underneath vehicular traffic that may have additionally contributed in the fracturing of the pipeline.
Ministry of Defense	Security history	Official letter signed by MEW Minister requesting: Log and report copies /description of all historical security breaches	The Ministry of Defense noted that it is concerned with the ROW crossing urban areas and associated fire and explosion risk this constitutes. It listed a number of vandalism events, fires, and crude oil thefts and arrests made in regard to the crude oil pipelines; given the dire economic situation and price of fuel, attempts to siphon off very old crude oil (40-50 years old) from the pipelines had increased in the last few years.
Lebanese Army	Security history	Official letter signed by MEW Minister requesting: Log and report copies /description of all historical security breaches	No feedback received as of date of this report
Ministry of Interior and Municipalities (MoIM) - Internal Security Forces	Security history	Official letter signed by MEW Minister requesting: Log and report copies /description of all historical security breaches	No feedback received as of date of this report
Regional and Local Authorities			
Governor of North (محافظ)	Highest authority in Governorate (Mohafazat)	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Could not be reached. MEW will ensure that Governor is contacted and engaged during the preparatory phase of this project.

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
District Commissioner (قائم مقام) – Minie-Danniyeh – Rola Al Bayeh	Highest authority in district (Caza) including Deir Ammar Village with Power Plant (PP)	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Has confirmed that there are no grievances or complaints raised against the power plant.
District Commissioner (قائم مقام) – Zgharta – Iman Al Rafi'i	Highest authority in adjacent district (Caza) that includes villages directly adjacent to Deir Ammar Village with PP	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Has confirmed that there are no grievances or complaints raised against the power plant.
Municipality of Beddawe – Mayor – Hasan Ghemrawi	Village adjacent to Deir Ammar Village including PP	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Stated that a complaint has been filed to Ministry of Environment (MoE) a few years ago (5 or 6 years ago approximately) regarding the air emissions from the power plant. No additional details or proof about the issue was provided.
Municipality of Beddawe – Member – Khaled Hanouf			• Lebanese army member (whom is also a community member) drowned a few months ago after getting sucked by the sea water inlet to the power plant while he was off duty spearfishing. • Can check with local fishermen who practice fishing near the power plant. • Could not find any official copies of any complaint submitted by the Municipality to MoE
Municipality of Deir Ammar	Village including Power Plant	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Could not be reached

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
Municipality of Minieh	Village almost adjacent to Deir Ammar Village including PP but extending along a considerable distance (4.6 km) downwind from the PP starting from 1.2 km until 5.8 km	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Could not be reached
Municipality of Mejdlaiya	Village adjacent to Deir Ammar Village including PP	Telephone Inquiry on: Knowledge and records of EHS (pollution) / OHS / community objections related issues	Could not be reached
NGOs and Civil Society Groups			
Marine Biodiversity / Protection NGOs	Interest group	Telephone Inquiry on: Observations supporting marine pollution from the power plant (cooling water effluent and wastewater discharges) / decline of quality/quantity of fisheries stocks	No details available on local marine biodiversity.
Akkarouna	Interest Group iActive in the entire North region (Akkar included) and supports vulnerable groups, including women and refugees. The NGO works under five pillars: Shelter, Protection, Governance, Livelihood and Social Stability. Two years ago, an emergency response unit was established	The director of the NGO Akkarouna was contacted over the phone on the 2nd of February 2022 in order to ask if they could provide support during different project phases and mainly in stakeholder engagement activities in the region and especially with vulnerable groups	Akkarouna is ready to assist in the project by supporting the access of information to local communities and vulnerable groups of any age and gender, in organizing and delivering focus group meeting and preparation of information briefs. The NGO is also ready to serve as a referral pathway to Gender Based Violence and sexual harassment. Akkarouna have a "hotline" number that can be used by the local community, and they are within the referral mechanism.

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
Trade unions / Cooperatives / Syndicates			
Cooperative for Fishermen - Tripoli Ahmad Akra	Interest group	Telephone Inquiry on: Observations supporting marine pollution from the power plant (cooling water effluent and wastewater discharges) / decline of quality/quantity of fisheries stocks	• The impact of the power plant on fish needs a detailed scientific study. However fishermen in the area are noticing a decline in fish populations in the area. • Not certain if the cooling water discharged into the sea affects marine life. • The main impact comes from the discharge of untreated WW into the sea from the area. The entire area is not served by wastewater treatment plants and therefore it can be assumed that all sewage generated in the area is discharged untreated in the sea.
Affected Communities and Social Welfare Resources			
Minieh Governmental Hospital Dr. Hasan Dheiby	Sensitive receptor downwind in Minieh Village	Telephone Inquiry on: Indications of air pollution related diseases in medical history of local population suggesting Power Plant as a source	It is possible that the increased rates of people suffering from allergy, asthma, cancer, and Chronic obstructive pulmonary disease (especially in areas located downwind) are due to the emissions from the power plant. However, this needs to be thoroughly studied.
Rawda Public School Mrs. Shahla Darwiche (Principle)	Sensitive receptor 290 m south of PP stacks (prevailing wind is southwesterly)	Telephone Inquiry on: • Observations supporting air pollution • Indications of air pollution related diseases in medical history of staff / faculty / students	• The school has around 350 students. Around 4 students in each class suffers from asthma. • She noticed increased cancer rates in the area surrounding the power plant but there is no information to ascertain

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
			whether this is directly attributed to the power plant. • There are many other sources of air pollution in the region extending between Deir Ammar and Tripoli (upwind) (DAPP2 Prelim. EIA)): Traffic, ships (port), car painting, furniture painting, landfill, ready mixed concrete plant, building construction, dust (geological) suspension from paved roads, fishing boats, unpaved unfenced parcels, road surface erosion, furniture manufacturing, and petrol transfer from tanks to road trucks, electrical power generators, and domestic heating. • The main source of NOx other than DAPP would be the main Tripoli-Akkar Road separating DAPP from Deir Ammar village. • The school suffers from vibration impacts (when the power plant is operational). • They sometimes smell gas odors at the school, but she is not certain if this originates from somewhere else. • She lives nearby as well, and noticed the weathering of her balcony tiles following winter rain.
Deir Ammar Technical Institute	Sensitive receptor 290 m south of PP stacks	Telephone Inquiry on: • Observations supporting air pollution	Did not accept to talk stating that they need an approval from the Directorate of technical education to do so.

Stakeholder Name	Justification for Engagement during Review Phase	Means of Communication / Information Requested	Summary of Feedback
		• Indications of air pollution related diseases in medical history of staff / faculty / students	
Al Marba Abd el Hadi Al Duhaibi Public School	Sensitive receptor 320 m south of PP stacks	Telephone Inquiry on: • Observations supporting air pollution • Indications of air pollution related diseases in medical history of staff / faculty / students	Could not be found
Other Affected Parties			
Piscine Aramen Beach Resort	Adjacent receptor to PP	Telephone Inquiry on: • Indications of associated air pollution suggesting Power Plant as a source • Indications of air pollution and marine water pollution and of associated diseases in medical history of staff suggesting Power Plant as a source • Observations supporting marine pollution from the power plant (cooling water effluent and wastewater discharges)	Contact number could not be found.
Academic Institutions			
Balamand University – Institute of Environment Dr. Manal Nader (Director)	Research/source of scientific data	Telephone Inquiry on: • Findings supporting marine pollution from the power plant (cooling water effluent and wastewater discharges)	There are no available studies on the marine environment near the power plant.

Table 5-2. Summary of consultations with local communities

Stakeholder category	Number/gender of stakeholders interviewed	Main concerns on possible restrictions on the use of the RoW	Communication pathways	Environmental, social and safety concerns	Grievance Mechanism uptake channels	Additional comments/ concerns
Mhammara						
Municipality of Mhammara	2 males	• The RoW is used mainly for agricultural purposes • Some structures are being established along the pipeline's RoW (nothing permanent)	• Establishing a committee at the municipality that supports access of information to local communities • Using posters • Though WhatsApp groups • Inviting the concerned people to the municipality to communicate the main restrictions that will be imposed	• The pipeline crosses agricultural areas and could cause vegetation poisoning • The gas pipeline is in close proximity to the oil pipeline that leaks and therefore could cause accidents and affect people's safety • Water networks could damage the gas pipeline	• Through the committee that can be established at the municipality • Through WhatsApp groups	• Safety measures should be put in place to avoid accidents • Waste is being dumped on the RoW which can affect the pipeline's integrity • The RoW should be supervised to limit activities that affect the pipeline's integrity, and the exact location of the water networks should be identified.
Vulnerable Groups: Refugee	1 male	• Stores and agricultural areas are located on the RoW • If restrictions related to permanent structures located on the RoW were imposed (mainly of the houses located along the RoW), affected people should be offered a compensation	• WhatsApp groups	• Not concerned about any potential impact on the environment, society and safety	• WhatsApp groups	

Stakeholder category	Number/gender of stakeholders interviewed	Main concerns on possible restrictions on the use of the RoW	Communication pathways	Environmental, social and safety concerns	Grievance Mechanism uptake channels	Additional comments/ concerns
Community located along the pipeline's RoW	1 male	• Owns a vegetable shop on the RoW • No specific concerns regarding any restriction that might be imposed on the RoW	• WhatsApp groups	• The project presents a positive impact as long as safety measures are implemented	• WhatsApp groups	
Sammounyeh						
Vulnerable Groups: Refugee women, men and elderly	10 refugees including 7 women, 2 elderly (males) and 1 man	• The RoW is used for agricultural purposes • Residential units are located on the RoW • Most of the refugees work in the agricultural area and hence restrictions on agricultural activities can affect the people's livelihood. Therefore, the affected people should be compensated	• WhatsApp groups or verbally over the phone	• Gas leaks could occur in case the pipeline was damaged and can hence affect the vegetation and generate odors • An explosion could occur	• WhatsApp groups	
Chir Hmairine						
Municipality of El Aabboudiye – Chir Hmairine	1 male	• Agricultural areas and around five houses are located on the RoW	• WhatsApp groups	• The project does not have a negative impact as the pipeline is underground and safety measures are implemented	• WhatsApp groups	

Stakeholder category	Number/gender of stakeholders interviewed	Main concerns on possible restrictions on the use of the RoW	Communication pathways	Environmental, social and safety concerns	Grievance Mechanism uptake channels	Additional comments/ concerns
Vulnerable Groups: Low income population living on the RoW (including women)	3 in total including 2 women and 1 man	• Residential units and agricultural areas are located on the RoW • Concerns regarding the possibility of resettlement	• Meetings can be conducted at the municipality and information should be communicated verbally	• The occurrence of gas leaks can affect people's safety • The gas pipeline is in close proximity to the oil pipeline. This oil pipeline is being ruptured by people for the purpose of stealing which is causing leakage and this can potentially affect the gas pipeline • An explosion could occur in case the pipe was damaged hence, regular maintenance should be conducted	• Through the municipality	The RoW should be constantly supervised to prevent any activities that can affect the pipeline's integrity and people's safety
Minieh						
Municipality of Minieh	1 male	• The RoW is used for agricultural and residential purposes	• Through the municipality	• The project does not have any potential negative impact on the environment, society and safety	• Through the municipality	The oil installations are limiting the establishment of permanent and temporary structures on the RoW
Vulnerable Groups located on the RoW: Women	1 female	• Owns a perfume store located on the RoW and other stores are also located on the RoW	• Through social media	• Gas leaks could cause health issues	• Whatsapp Groups	

Stakeholder category	Number/gender of stakeholders interviewed	Main concerns on possible restrictions on the use of the RoW	Communication pathways	Environmental, social and safety concerns	Grievance Mechanism uptake channels	Additional comments/ concerns
Vulnerable Groups located on the RoW: Refugees	1 male	• Owns a Kiosk located on the RoW • Stores and residential units are found on the RoW • Compensation should be offered in case restrictions were imposed on the operation of the kiosk during project implementation	• Information and restrictions should be communicated verbally and in person	• Gas leaks could occur		

Stakeholder category	Number/gender of stakeholders interviewed	Main concerns on possible restrictions on the use of the RoW	Communication pathways	Environmental, social and safety concerns	Grievance Mechanism uptake channels	Additional comments/ concerns
Mhammara						
Municipality of Mhammara	2 males	• The RoW is used mainly for agricultural purposes • Some structures are being established along the pipeline's RoW (nothing permanent)	• Establishing a committee at the municipality that supports access of information to local communities • Using posters • Though WhatsApp groups • Inviting the concerned people to the municipality to communicate the main restrictions that will be imposed	• The pipeline crosses agricultural areas and could cause vegetation poisoning • The gas pipeline is in close proximity to the oil pipeline that leaks and therefore could cause accidents and affect people's safety • Water networks could damage the gas pipeline	• Through the committee that can be established at the municipality • Through WhatsApp groups	• Safety measures should be put in place to avoid accidents • Waste is being dumped on the RoW which can affect the pipeline's integrity • The RoW should be supervised to limit activities that affect the pipeline's integrity, and the exact location of the water networks should be identified.
Vulnerable Groups: Refugee	1 male	• Stores and agricultural areas are located on the RoW • If restrictions related to permanent structures located on the RoW were imposed (mainly of the houses located along the RoW), affected people should be offered a compensation	• WhatsApp groups	• Not concerned about any potential impact on the environment, society and safety	• WhatsApp groups	

Community located along the pipeline's RoW	1 male	• Owns a vegetable shop on the RoW • No specific concerns regarding any restriction that might be imposed on the RoW	• WhatsApp groups	• The project presents a positive impact as long as safety measures are implemented	• WhatsApp groups	
Sammounyeh						
Vulnerable Groups: Refugee women, men and elderly	10 refugees including 7 women, 2 elderly (males) and 1 man	• The RoW is used for agricultural purposes • Residential units are located on the RoW • Most of the refugees work in the agricultural area and hence restrictions on agricultural activities can affect the people's livelihood. Therefore, the affected people should be compensated	• WhatsApp groups or verbally over the phone	• Gas leaks could occur in case the pipeline was damaged and can hence affect the vegetation and generate odors • An explosion could occur	• WhatsApp groups	
Chir Hmairine						
Municipality of El Aabboudiye – Chir Hmairine	1 male	• Agricultural areas and around five houses are located on the RoW	• WhatsApp groups	• The project does not have a negative impact as the pipeline is underground and safety measures are implemented	• WhatsApp groups	

Vulnerable Groups: Low income population living on the RoW (including women)	3 in total including 2 women and 1 man	• Residential units and agricultural areas are located on the RoW • Concerns regarding the possibility of resettlement	• Meetings can be conducted at the municipality and information should be communicated verbally	• The occurrence of gas leaks can affect people's safety • The gas pipeline is in close proximity to the oil pipeline. This oil pipeline is being ruptured by people for the purpose of stealing which is causing leakage and this can potentially affect the gas pipeline • An explosion could occur in case the pipe was damaged hence, regular maintenance should be conducted	• Through the municipality	The RoW should be constantly supervised to prevent any activities that can affect the pipeline's integrity and people's safety
Minieh						
Municipality of Minieh	1 male	• The RoW is used for agricultural and residential purposes	• Through the municipality	• The project does not have any potential negative impact on the environment, society and safety	• Through the municipality	The oil installations are limiting the establishment of permanent and temporary structures on the RoW
Vulnerable Groups located on the RoW: Women	1 female	• Owns a perfume store located on the RoW and other stores are also located on the RoW	• Through social media	• Gas leaks could cause health issues	• Whatsapp Groups	

Vulnerable Groups located on the RoW: Refugees	1 male	• Owns a Kiosk located on the RoW • Stores and residential units are found on the RoW • Compensation should be offered in case restrictions were imposed on the operation of the kiosk during project implementation	• Information and restrictions should be communicated verbally and in person	• Gas leaks could occur		

6. CONCLUSION AND RECOMMENDATIONS

This potential World Bank financed project consists of rehabilitation and operation of the Lebanese segment of the Arab Gas Pipeline (31 km approx.) and subsequent operation of the Deir Ammar Power Plant (DAPP) based on NG instead of gasoil; DAPP is already connected to the pipeline.

DAPP, which is a combined cycle gas (and steam) turbine based plant, was initially designed and built to run on natural gas; it relied on gasoil in the last decade because the war in Syria resulted in shutting down NG supply from Syria. DAPP can easily switch back to NG, which will reduce and eliminate key emissions and hazardous waste, namely air emissions, oil-water separator effluent discharge at sea and oil-water separator sludge being currently used as HFO in other power plants.

Despite having a safety manual and reporting on OHS aspects, DAPP is not directly managing environmental and social (E&S) aspects or reporting on them. This leaves DAPP with a set of E&S gaps that require addressing prior to operation on NG in order to achieve compliance with ESF and national standards.

It is recommended to first conduct an environmental audit on DAPP and accordingly develop EHS procedures and a monitoring plan to achieve compliance. Cooling water return flow to sea is an important aspect that must be inspected for compliance with national (35 °C effluent temperature) and WB standards (3 °C temperature differential at edge of mixing zone).

An FGRM shall be created for DAPP and implemented to facilitate feedback, claims, and complaints from the general public; it will be widely disseminated with information on the resolution timelines, responsible persons, and option for appeals. Referral pathways for SEA/SH shall be established and communicated.

The AGP was built inside an ROW averaging a width of 24 meters that comprises old crude oil pipelines from the days when the TOIL Beddawi refinery was operational (1950s-1960s).

The AGP has not been operational for over a decade but a low gas pressure inside the pipe has been maintained to prevent its deterioration and the TOIL-AGP team kept monitoring it during all this time. Notwithstanding, it is in need of repairs and the contractor operating the AGP Jordan segment of the AGP (TGS) is in the process of being contracted to conduct the repairs and operate the pipeline.

Given certain illegal encroachment activities by private individuals along the ROW (such as agriculture, private backyard extension, vehicle parking spaces, and outdoor storage) coupled with a historical lack of safety studies and clear definition of safety distances for the gas pipeline specifically, MEW will be launching the necessary risk assessments. Those will provide definite answers on the required safety separation distances and tolerated activities adjacent to the ROW, which in turn will inform any plan to stop such activities and launch livelihood restoration plans where applicable.

For the rehabilitation and operation phase, the main gaps are social in nature because the contractor is quite capable of managing EHS risks given they are ISO certified for environmental and OHS management. Accordingly, Environmental, OHS and Social aspects at the Power Plant shall be covered in dedicated procedures covering environmental and

social risks, KPIs, monitoring requirements, reporting, evaluation, and corrective measures. A Grievance Redress Mechanism (GRM) for employees covering Sexual Exploitation and Abuse, and Sexual Harassment (SEA/SH) and FGRM for the general public shall also need to be developed with facilitated 2-way communication mechanisms.

An overarching EHSMS covering applicable risks with clear assignment of responsibilities and accountability for both the Owner (TOIL) and the Operator (TGS) is key for proper implementation of the project.

ANNEXES

ANNEX A – COMPLETE LIST OF FINDINGS FOR DEIR AMMAR POWER PLANT

Table A1. Environmental and Social Review of Deir Ammar Power Plant provides the comprehensive list of Environmental and Social review findings at Deir Ammar Power Plant and Table A2. List of Significant Health and Safety Hazards – Deir Ammar Power Plant lists the significant OHS hazards.

Supporting documentation is provided in Appendices as listed below:

Appendix	Documents
A1	- Historical Imagery showing Power Plant(Google Earth TM) - Deir Ammar Power Plant Layout (Colored) - Deir Ammar Power Plant Layout (Black and White) - Deir Ammar Power Plant Boundary, SPM, Water Intake Pipe, Warning Signs, Restricted Marine Area (Provided by EDL/Primesouth)
A2	- Decree 6862 / 1995 Defining the Construction of Deir Ammar Power Plant Layout as Public Benefit and Expropriation of the Plots for the Benefit of EDL - Memorandum by the Government of Lebanon to Iraq Petroleum Company Declaring the Nationalization of their Assets and Land - Correspondence between EDL and MEW Requesting Information on Ibrahim Al Dohaibi Claim against EDL - Demand Letter for Compensation for Diver Fatality - EDL Legal Department Opinion on Diver Fatality Demand Letter - EDL Reply to Demand Letter for Compensation for Diver Fatality
A3	- Power Plant & AGP Relevant Environmental Legislation and Standards - Power Plant Oil Water Separator Effluent Analysis by ELARD in 2019
A4	- Tripoli Oil Installations Correspondence on ROW Encroachment Status
A5	- Power Plant Detailed Technical Requirements - Civil Works - Power Plant Contractual Performance Guarantees Vol. 4 – Select Pages - Power Plant Contractual Performance Guarantees Vol. 6 – Select Pages
A6	- Power Plant 2021 Accident Reports List - Power Plant Monthly EHS Report - Power Plant Quarterly EHS Audit Report
A7	- Power Plant Organizational Chart (Nov-2021) showing Females in Red Font
A8	- Power Plant Chemical Management and Unloading Emergency Procedure - Power Plant Safety Procedures - Power Plant Safety Escape Plan
A9	- Power Plant Administrative Labor Procedure for Code of Conduct
A10	- Power Plant 4 to 10 October 2021 Operational, Maintenance, and Chemical Reports - Power Plant September 2021 Monthly Power and Efficiency Monitoring Report for Gas Turbine 1 (GT1) and Steam Turbine (ST)

	- Power Plant September 2021 Monthly Pump Efficiency Test Report
A11	- Power Plant - Sewage Treatment Plant (STP) Treatment System - Power Plant STP Effluent Analysis by IRI on 19 March 2019 - Power Plant STP Effluent Analysis by IRI on 24 Feb 2020
A12	- Power Plant Folder Including List of Chemicals Stored & Location and MSDS's - Power Plant Chemical Storage Room Photo 1 - Power Plant Chemical Storage Room Photo 2 - Power Plant Above Ground Storage Tanks for Diesel Over Concrete Platform - Power Plant Type of Hazard Identification for Stored Chemicals in May 2021 Quarterly Safety Report - Power Plant Oily Drainage Network
A13	- Power Plant Operation and Maintenance Procedures - Power Plant Training
A14	- Circular 8/2021 on risks to public from Coastal Facilities and Power Plants as well as Precautionary Measures to be taken by such Facilities - Power Plant 2018 Stack Emission Measurements - Power Plant Greenhouse Gas Emission Estimates by MoE/UNDP - Power Plant and Arab Gas Pipeline Stakeholder Feedback

TABLE A1. ENVIRONMENTAL AND SOCIAL REVIEW OF DEIR AMMAR POWER PLANT

On-Site Data Collection: 8 Nov 2021

Participants:

Morning Session: Tony Yaacoub (PP Manager); Mayssam Zakaria (Exploitation Department); Fadi el Hassan (Safety and Environment Department); Fadi al Aassal (Maintenance Department); Mounzer Daraki (Performance Monitoring Department),

Afternoon Session: Additionally included Fergal O'Loughlin (Plant Superintendent), Elvis Aley-ay (EHS Manager however no Environmental qualifications or training), and later Talal al Mawass (Chemical Engineer responsible for chemicals onsite)

Task	Applicability	Power Plant Availability / Feedback	Summary of Key Issues	Supporting Docs. Appendix
Document the historical background of the facility such as:				
• **Geographical location documented by historical Google maps**	✓	Layout and components + Google Earth historical images until oldest available in 2004 + Google Earth KMZ file showing boundary and offshore structures as provided by facility in **Appendix A1.**		Appendix A1
• **Routing**	×	NA[10]		
• **Start and end of construction dates**	✓	1995 – 1998		
• **Financing the construction and installations and main contractor(s)/suppliers involved**	✓	Financing by SAN PAOLO IMI (EX CREDIOP), COMMERZBANK, PARIBAS, FADES, and others 1995 – 1998: EPC by Ansaldo (Italian) and Siemens (German) 1998 – 2000: O&M by Ansaldo (Italian) 2000 – 2002 : O&M by ENEL (Italian) 2002 – Feb 2006: O&M by EDL[11] Lebanese Subcontractor PSM (Poor experience with contract model) Feb 2006 – Feb 2011: O&M by KEPCO (Korean) Feb 2011 – Feb 2016: O&M by YTL (Malaysian) Feb 2016 – Feb 2021: O&M by Primesouth (American) Feb 2021 – Feb 2022: O&M by Primesouth (American) Feb 2022 – Feb 2027: O&M contract renewal negotiations with Primesouth being undertaken		
• **Any legacy issues concerning environmental aspects, land ownership, social and community issues, etc.12**	✓	- Pending claim for land exploitation by Al Hajj Ibrahim Al Dohaibi (99 year concession by IPC) and request for compensation for lost trees when Power Plant was built (Supporting documents in **Appendix A2** consist of 2 2018-2019 correspondence forms and data requests from EDL to MEW, with MEW responding that MEW does not have any documents / info concerning the claim and that CDR, as the PP project proponent, should be contacted for that matter (CDR and EDL were contacted but the original claim could not be obtained). - Public complaint with media coverage in 2018 regarding black oil slick observed at sea facing the PP; ELARD inspected the facility and noted that the event chronologically followed a tank cleaning event in addition to showing that the analyzed petroleum residue from the beach outfall from which most wastewater generated on-site except for cooling water exhibited the same chromatographic signature as the analyzed oil-water separator effluent. ELARD also proved by dye testing that the storwater drainage main outside the facility along the Tripol-Akkar Road flows into a culvert underneath the PP and reaches the same beach outflow. The Operator reported that tank cleaning is not drained to sea and is diverted to the oil-water separator that may have been overloaded resulting in poor treatment; EDL reported that pollution may have originated from outside the facility from the public stormwater given the culvert underneath the facility. - Public complaint with media coverage regarding an army member who drowned beginning of 2021 while spearfishing opposite the PP due to be pulled down by the flow of the cooling water inlet pipe. This area at sea is a restricted area albeit poorly delineated onshore at the time and lacking complete delineation with floating signage / buoys at sea. Operator has installed additional signs onshore and ordered a buoy to be placed at sea.	- Pending Al Dohaibi Claim against EDL for compensation for lost trees in PP area when PP was constructed in 1995 is following legal course. - Public complaint regarding petroleum spill at sea in 2018; this issue has had no legal or publicity follow-up. - Public complaint and demand letter for financial compensation (LBP 1 Billion) by family lawyer regarding army member who drowned while spearfishing opposite the facility, which was attributed to suction flow from the inlet pipe (**Appendix A2**). Case has not gone to court yet as communicated by EDL.	Appendix A2
• **Historical land use of the facility site and surroundings (supported by maps)**	✓	Initially owned by Iraqi Petroleum Company and Mediterranean Sea Pipeline Company Limited then nationalized by GoL[13] in 1973 and ownership transferred to EDL – MEW **(Appendix A2)**. Prior to construction of the Power Plant, the land comprised a golf court for LOI[14] from the 1950's until construction of the PP in 1995.		Appendix A2

10 Not Applicable

11 Electricite du Liban

12 This may require consultations and interviews with surrounding communities and local NGOs.

13 Government of Lebanon

14 Lebanon Oil Installations