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Papua LNG Project
Upstream ESHIA Synthesis

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Creating Sustainable Value

PAPUALNG

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Executive Summary

This Environmental, Social and Health Impact Assessment (ESHIA) Synthesis has been prepared on behalf of TotalEnergies EP PNG Limited (TEP PNG), as the operator of the upstream and midstream components of the proposed Papua Liquefied Natural Gas (LNG) Project, located in Papua New Guinea (PNG). It covers the upstream and midstream components only (collectively, Upstream Components) that are hereafter referred to as the "Papua LNG Project" or the "Project".

This Synthesis is desktop-based and consolidates the Project's environmental and social (E&S) assessments. It draws on the extensive body of Project documentation produced since the Upstream Environmental Impact Statement (2019), hereafter referred to as EIS (2019), including the:

- Upstream EIS PRL-15 Addendum: Main Report & Appendices (2024), hereafter referred to as EIS Addendum (2024).
- FEED Changes Environmental Assessment Report (2025), hereafter referred to as FEED Changes EAR (2025); and
- Specialist topic studies.

Impact identification and significance evaluation aim to align with PNG regulatory requirements and international standards, including the International Finance Corporation (IFC) Performance Standards (PS), Equator Principles (EP), and OECD Common Approaches.

This executive summary highlights the key E&S topics assessed throughout this ESHIA Synthesis.

Site Location and Project Overview

The assessment confirms that the Project is located within a remote, environmentally and socially sensitive context characterised by customary land tenure, high dependence on land, riverine and marine resources, and the presence of Indigenous Peoples (IP) with strong cultural and livelihood connections to the Project Area of Influence (PAoI).

The Project consists of three wellpads within the Elk and Antelope gas fields. Two of these wellpads (ANT-10 and ELK-10) will produce reservoir fluids. The third (ANT-11) will be used as an injection wellpad for the reinjection of water and acid gas. Reservoir fluids will be transported from ELK-10 to ANT-10 via two 14" diameter buried pipelines and then transported south from ANT-10 via two 22" diameter buried pipelines (approximately 10 and 30 km long respectively) to a Central Processing Facility (CPF) located 120 m inland from the north-western bank of the Purari River.

The CPF will require vegetation clearance and earthworks. It will comprise of processing units, utilities, condensate storage, flares and vents, and marine offloading facilities. At the CPF, reservoir fluids will be separated into gas, condensate, water and acid gas, with water and acid gas transported north via dedicated pipelines (approximately 30 km) to the ANT-11 wellpad, where reinjection in the reservoirs will take place. Two export pipelines will transport gas and condensate south to Orokolo Bay on the Gulf of Papua coastline. Once offshore, the subsea and condensate pipelines diverge. Gas will be transported southeast approximately 260 km to the existing PNG LNG plant in Caution Bay, where the gas will be treated and liquified to commercial LNG specifications. The condensate pipeline will transport condensate southwest approximately 90 km to a third party operated Floating Storage and Offloading (FSO) unit.

Supporting infrastructure includes approximately 43 km of private roads, expanded facilities at Herd Base, quarries, borrow pits, spoil sites, the upgraded Purari Airstrip, temporary camps, helipads, waste management areas and river dredging (approximately 2 million m^3) for navigation.

The design life for the Project is 30 years, 5 years of construction and 25 years of operations. The facilities will also undergo a decommissioning phase post this 30-year Project life.

Construction logistics will rely heavily on marine, river, road, and air transport, with over 85,500 personnel movements forecast during the five-year construction period. Workforce numbers will peak at approximately 6,000 (incl. both onshore and offshore personnel) during construction, reducing to approximately 250-300 during operations. Multiple temporary construction camps, and a long-term operations camp at Herd Base will accommodate workers.

The Project has been designed to minimise its disturbance footprint as far as practicable by limiting the extent and duration of land take and, where possible, utilising previously disturbed areas. The total Project disturbance footprint, across onshore and offshore components, is approximately 2,453 ha. Of this, the EIS Addendum (2024) estimates that approximately 190 ha will be located on previously disturbed land, thereby avoiding new impacts on undisturbed areas. In addition, around 1,280 ha of the Project footprint will be temporary, with these areas planned to be rehabilitated and restored post-construction, primarily through natural regeneration, to further minimise long-term residual impacts. See Section 3, Table 3-3,for a further breakdown of the different Project components.

The Project's Area of Influence (PAoI) is presented in Figure 0-1 below.

Summary of Key Findings

The Synthesis identifies a range of E&S risks, the majority of which are associated with construction phase activities and are localised in nature. These risks occur within a remote, predominantly Indigenous context with high dependence on customary land and natural resources. Key environmental risks are driven by construction activities, with additional considerations during operations related to greenhouse gases (GHG), biodiversity, water resources and cumulative effects. Social risks relate to land access and livelihood disruption, community health and safety (particularly along transport, dredging and barging corridors), Indigenous rights, the requirement for Informed Consultation and Participation (ICP) and Free, Prior and Informed Consent (FPIC) processes, labour and working conditions, and the management of stakeholder expectations in a long-duration, multi-phase development.

The Project has an existing Environment and Social Management System (ESMS) that provides the overarching framework for systematically identifying, assessing, and managing health, safety, security, E&S risks, throughout the Project life-cycle and PAoI. The ESMS builds on the commitments register established in the EIS (2019) and incorporates additional commitments introduced within the EIS Addendum (2024), FEED Changes EAR (2025), Purari River Dredging and Barging Impact Assessment hereafter referred to as D&B ESIA (2025), and Hou Creek Aggregate Dredging Environmental Assessment Report, 2025, hereafter referred to as Hou Creek Aggregate Dredging EAR (2025), to reflect Project design updates.

Across E&S topics, avoidance and minimisation have been incorporated into Project design where practicable, with residual risks addressed through targeted management measures. Impacts persist where values are irreplaceable, receptors highly sensitive, or Project footprints permanently alter land, water, or cultural systems.

Overall, the predicted E&S impacts, will be predominantly associated with the construction phase, are anticipated to remain localised, and are considered manageable through the Project's planned mitigation measures and ESMS. Successful delivery will depend on continued engagement with communities (ICP) and FPIC processes, effective land and resource access processes, long-term biodiversity offset programmes, and ongoing monitoring and adaptive management throughout the Project lifecycle.

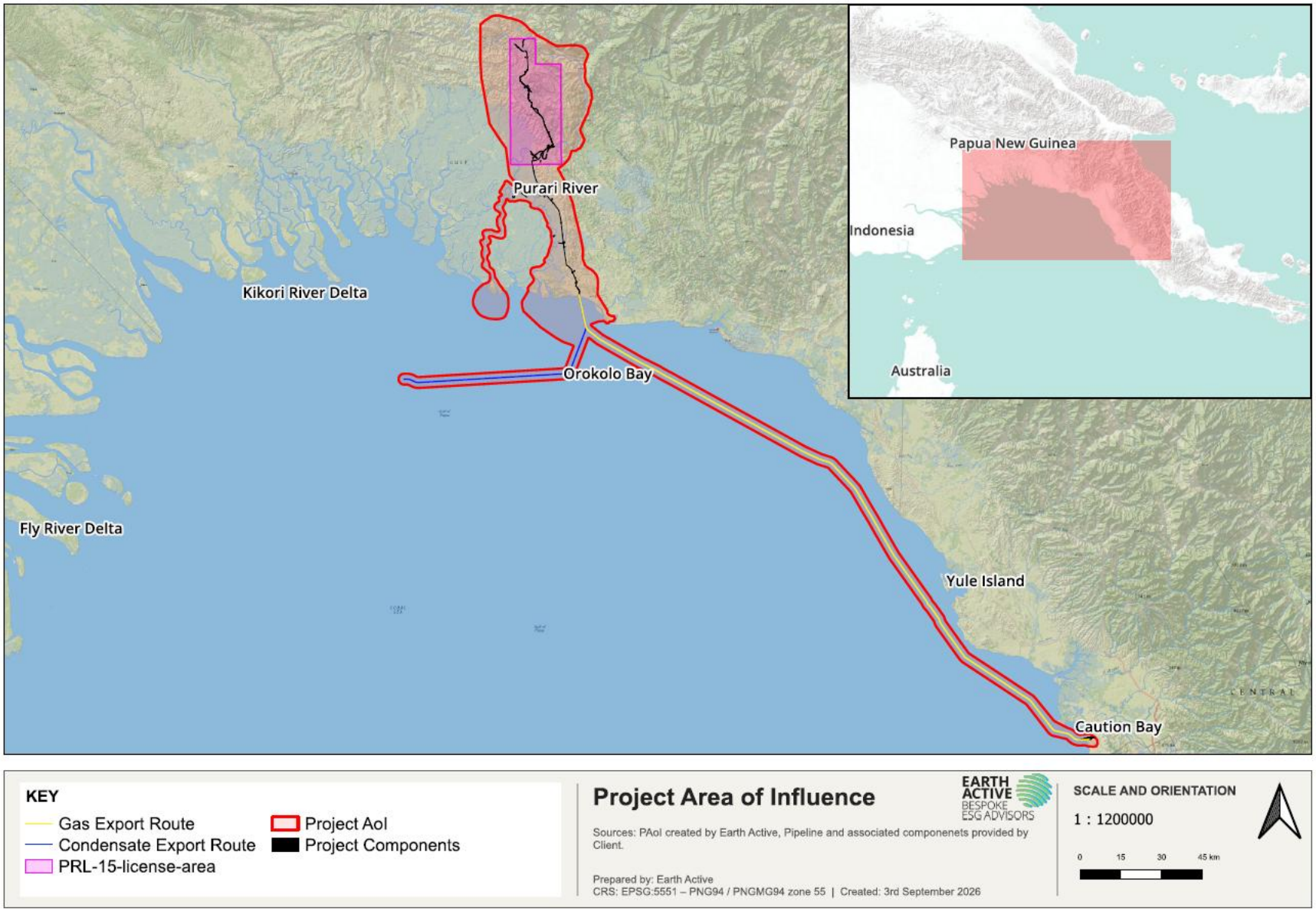

Figure 0-1: Updated Project Area of Influence (Source: Earth Active, 2026)

Key Environmental Risks and Impacts

Environmental risks associated with the Project are primarily driven by construction activities across a remote and environmentally sensitive landscape that includes intact terrestrial forests, freshwater and estuarine systems, and diverse marine habitats. Key material environmental risks relate to habitat loss and fragmentation, sedimentation and water-quality changes, underwater and terrestrial noise, waste generation, increased riverine and marine traffic, and potential introduction or spread of invasive species.

The Project's environmental residual impacts are predominantly Minor to Moderate following the application of the mitigation hierarchy, FEED optimisation, and topic-specific management plans. Moderate residual impacts remain associated with permanent vegetation loss and fragmentation in Critical Habitat-qualifying forest habitat, geomorphological change and sedimentation in freshwater systems, and localised permanent loss of marine and riverine habitat where infrastructure, aggregate dredging, and vessel traffic are required. In the Purari River system, aggregate dredging and increased vessel movements may result in changes to riverbed and sandbank morphology, increased suspended sediments, and localised disruption to aquatic habitats and ecosystem services, despite avoidance and control measures. Disturbance to fauna and focal breeding and roosting sites may occur through noise, vibration and light emissions. These environmental impacts are managed through a combination of route and site selection to avoid the most sensitive areas, engineered sediment and erosion controls, dredging management and monitoring, progressive rehabilitation, biodiversity offsets where required, and adaptive management. Although some impacts linked to permanent infrastructure and high-sensitivity environments cannot be fully eliminated, they can be reduced to acceptable residual levels under international standards.

Overall, with the ESMS and environmental management plans in place, environmental risks are considered localised, manageable, and predominantly low in residual significance, subject to continued monitoring, adaptive management, and compliance with IFC PS requirements.

Major Hazards and Process Safety

Major hazards are associated with very low likelihood accidental, upset or abnormal events. Although, the likelihood of major accidents is low, the fact that these can result in high consequences, such as multiple fatalities, means that major hazards and the risk of these must be managed accordingly. Key hazards including fires, explosions, toxic gas release, seismic damage, and fuel spills have been identified through detailed risk assessments, with mitigations reducing risks to As Low as Reasonably Practicable (ALARP). Facilities incorporate safety-by-design features such as fire zone segregation, blast-resistant structures, monitored buried pipelines, advanced detection systems, shutdown protocols, and defined evacuation routes. Emergency preparedness is provided through an Affiliate Emergency Response Plan, hereafter referred to as Affiliate ERP, Oil Spill Contingency Plan (OSCP) and Blowout Contingency Plan (BOCP), with regular drills, community communication, and development of a community-specific ERP (which will either be a standalone document or integrated into the ERP described immediately above). Residual risks will be managed through ongoing safety systems, periodic risk reduction workshops, and updates to emergency and spill response plans.

Greenhouse Gases (GHG)

Scope 1 and 2 emissions have been incorporated in the Climate Change Risk Assessment Synthesis Report, 2025, hereafter referred to as CCRA Synthesis Report (2025). Scope 1 emissions are comprehensively defined across Project infrastructure and activities whilst Scope 2 emissions are negligible due to self-generation of power. Construction emissions are dominated by land-clearing carbon stock loss (equivalent of less than 2% of lifetime Scope 1 emissions over the Project time), while operational phase emissions are driven by power generation, flaring/venting, and transport, partially offset by long-term acid gas reinjection (approximately 18,000 kt CO_{2e}). Operational emissions peak mid-life and decline with reduced LNG production. Mitigation

measures include no routine flaring, energy efficiency, acid gas reinjection and operational controls that are embedded in design and management plans.

Air Quality

Ambient air quality is good, with few nearby sensitive receptors and negligible background pollutant levels. The closest sensitive receptor is identified as Pokore Hamlet. Modelling for normal operations and flaring scenarios shows predicted concentrations of key pollutants (NO_2, SO_2, CO, $PM_{2.5}$ and PM_{10}) are well below international guidelines. Construction impacts are low for health and dust nuisance, with medium short-term ecological effects during earthworks that are expected to recover quickly; operational emissions remain within criteria. Mitigation includes stack design, flaring limits, acid gas reinjection, dust control, equipment maintenance, low-sulphur fuel use, and emissions monitoring.

Climate Change and Climate Risk

The Project's most material current physical risks relate to baseline climate hazards, including flooding, rainfall-induced landslides, extreme heat, and coastal processes. These risks are particularly relevant due to reliance on linear infrastructure (roads, pipelines, barging), where access disruption and logistics impacts remain credible. Overall vulnerability under present-day conditions is generally low to medium due to high adaptive capacity.

Future climate change is expected to exacerbate these existing hazards, increasing their intensity, frequency, and/or likelihood over time. As a result, risks associated with flooding, extreme rainfall, and heat stress may become more significant, particularly beyond 2030 under higher emissions scenarios.

Mitigation includes acid gas reinjection, climate-resilient design, drainage and erosion control, cooling systems, corrosion protection, proactive maintenance, and market risk strategies.

Transition risks are also expected to increase over time, especially beyond 2030 under faster decarbonisation pathways, with market and reputational risks becoming more prominent. While many risks can be mitigated through engineering design, operational controls, contractual structures, and lower-carbon technologies (e.g. CO_2 sequestration, hydrogen-ready power), long-term resilience will depend on proactive adaptation and evolving market strategy.

Noise and Vibration

Baseline monitoring indicates ambient noise is primarily from natural sources and village activities, with limited existing industrial noise. Modelling shows construction and normal operations will generally meet Project noise criteria, with exceedances during infrequent abnormal conditions such as flaring. Underwater noise from piling, dredging, vessel traffic, and offshore works may exceed disturbance thresholds for some aquatic fauna.

Application of the Project's Noise & Vibration Management Plan and associated controls will support mitigation of Project impacts. Residual effects during CPF construction and operations are expected to be Minor to Moderate. Localised Moderate residual noise impacts are anticipated at Pokore Hamlet, particularly at night or during abnormal flaring events, due to its proximity. These are limited to specific activities and weather enhanced propagation, and would be managed through scheduling, equipment controls, and community notification. Further noise assessments will be undertaken during detailed engineering. Other components such as pipeline shore crossing, dredging and Horizontal Directional Drilling (HDD) produce Negligible or Minor residual terrestrial noise due to distance and very small exceedances (≤2 dBA).

Given the short duration, spatially limited nature of construction noise sources, and the mitigation and monitoring framework in place, residual underwater noise impacts are assessed as Minor, temporary, and not significant for riverine and marine fauna populations. Underwater vibration effects are closely linked to

underwater noise and are expected to be generally confined to short-term, localised disturbance in the immediate vicinity of active works.

Mitigation includes design controls, restricted work hours, community notification, noise suppression devices, soft-start piling, marine fauna observation protocols, and compliance monitoring.

Vibration impacts associated with construction, dredging, pipeline installation, and vessel movements are expected to be localised, low-energy, and short-term, with residual impacts assessed as Minor to Negligible for all onshore receptors following mitigation. Baseline vibration levels are very low in the PAoI, there are no vibration-sensitive structures, and vibration attenuates rapidly with distance; no significant effects to communities, buildings, or heritage assets from vibration are anticipated, with management provided through standard construction controls and monitoring.

Soils and Geology

The Project area features ridge and ravine terrain, alluvial plains, and coastal lowlands, with poorly developed soils and high acid sulphate potential in low lying areas. Geohazards include erosion and landslides in steep or weak strata but these risks have been considered in facilities design, and the CPF site is considered generally stable. Construction will disturb soils, posing risks of erosion, acid sulphate oxidation, and accidental contamination. Mitigation includes progressive rehabilitation, erosion controls, Potential Acid Sulphate Soil (PASS) management, and spill prevention and contingency measures. Residual impacts to soil and geology are assessed predominantly as Negligible to Minor. Moderate residual impacts are confined to slope instability (landslide/mass movement) in ridge/ravine landforms and at Elk-2 borrow pit and associated trunklines/roads. Most other soil risks, such as local erosion at specific borrow pits, sandy soil destabilisation, PASS oxidation/disturbance, facility cut-and-fill instability, and HDD-related disturbance at the shore crossing, are assessed as Negligible.

Hydrology, Hydrogeology and Water Resources

The lower Purari River catchment has high flows, elevated turbidity, low nutrients/metals, and some sediment and soils with high acid sulphate potential. Project works may cause localised changes to hydrology, sediment transport, and water quality, with minor effects from dredging, vessel traffic, and crossings; a trenchless method will be used for the Purari River pipeline crossing. Shallow groundwater used by villagers and sourced from local village wells generally meets chemical standards for drinking water. Historical observations of shallow groundwater quality have indicated the presence of elevated levels of microbiological indicators/pathogens that are unrelated to Project activities. Shallow groundwater sources at inland and coastal villages along the pipeline export route (PER) have been found to be vulnerable to drawdown as a result of pipeline trenching. Potential contamination to shallow groundwater sources at coastal and inland villages and the CPF site has also been identified as a result of accidental spills or due to waste leachates. Mitigation will include erosion controls, progressive rehabilitation, PASS management, low-impact pipeline river crossing methods, water extraction limits, and spill prevention. Residual impacts are expected to be mostly Negligible to Minor. Activities along the Purari River and at Hou Creek associated with aggregate dredging, and the potential for accidental hydrocarbon spills, retain Moderate residual impacts, particularly related to water quality deterioration and geomorphological disturbance, although these remain spatially limited and manageable. Potential soil erosion due to ground disturbance at CPF P3 site, causing increased TSS, turbidity and sedimentation of defined waterways, also retains a Moderate residual impact.

Resources and Waste Management

The Project's resource needs primarily focus on construction aggregates, with an estimated 2.7 MT sourced from quarries, borrow pits and dredging upstream and downstream of Hou Creek in the Purari River. Key potential impacts include vegetation loss, soil and habitat disturbance, hydrology and water-quality changes,

dust, noise, vibration, waste generation, invasive species risks and short-term community effects. Mitigation measures such as phased clearing, erosion controls, spill prevention, ecological surveys, weed and pest management, and dust/noise suppression are expected to reduce most residual impacts to Negligible or Minor levels. The main remaining concern is a Moderate residual impact on surface water quality from accidental hydrocarbon or chemical spills during dredging at Hou Creek.

The construction and operation of the Project will generate large volumes of non-hazardous and hazardous waste, which will require management and disposal. The waste mitigation hierarchy will be implemented, favouring avoidance, reduction, reuse and recycling where practicable. Hazardous waste will be removed from site for management in Port Moresby or overseas if required. A landfill shall be constructed in PRL-15 in accordance with requirements outlined in the Company's general specification for Landfill Design and Operation for E&P Sites (GS EP ENV 421) (Ref. PG-P15-00-PHSE-000032) and will accommodate general non-hazardous waste, with an estimated capacity of approximately 50,000m^3. During construction, temporary incinerators may be mobilised to sites to manage (i.e. reduce the volume of) appropriate waste streams. During the latter stages of the early works and throughout operation, a suitably sized, purpose-built, high-temperature, industrial incinerator may be installed. This will be designed according to IFC Environment, Health and Safety (EHS) standards. Long term operational waste will be managed under the Level 3 environmental permit and the Project Waste Management Plan (2024), hereafter referred to as Waste MP (2024) to prevent land, water, and habitat impacts.

Landscape and Visual Amenity

PRL-15 is characterised by dense native vegetation, rugged and flood-prone terrain, low population density, and limited existing development, resulting in few locations with meaningful visual exposure. The closest receptor is Pokore Hamlet, established in 2019 with direct views across the Purari River to the CPF site. A 3D Light Detection and Ranging (LiDAR)-based viewshed analysis (EIS Addendum, 2024) confirms that only a small number of receptors have potential views of Project infrastructure. The CPF flare and hot water stack are the most visually prominent elements, theoretically visible up to 12 km, though actual visibility is substantially reduced by topography and 20 to 40 m canopy cover. With mitigation (vegetation buffers, rehabilitation, controlled lighting, no routine flaring), residual impacts are assessed as being Negligible to Minor for all receptors. Moderate residual visual and lighting impacts may remain at Pokore Hamlet, where consultation and engagement will focus on addressing these issues and monitoring post construction residual impacts.

Marine Physical Environment

Surveys in Orokolo Bay, the offshore pipeline route, and Caution Bay have indicated good marine water quality and good sediment quality. FEED changes have resulted in updated construction methodologies, including the use of HDD at Caution Bay and a reduced cofferdam at Orokolo Bay, which will limit disturbance to coastal processes, turbidity, and sensitive habitats during construction and installation of the pipeline shore crossing. Hydrotest water discharges and vessel effluents will be managed according to applicable MARPOL standards (International Convention for the Prevention of Pollution from Ships). With reduced volumes by reusing hydrotest water and reduced vessel routes; impacts are anticipated to be localised and short-term. Mitigation will include trenchless pipeline shore crossings, optimised design, erosion controls, adaptive trenching management, low-toxicity additives to hydrotest water, and compliance with applicable discharge standards. Residual impacts are expected to be Negligible to Minor.

Traffic and Transportation

Transport activity for the Project is concentrated along the Purari River, a corridor frequently used by communities and highly sensitive due to the absence of practical alternative travel routes. During construction, particularly in the peak period, Project aviation, barging, ferry movements and dredging will

temporarily increase, creating short-term and localised effects such as river-user congestion, navigation and safety risks, wake impacts, access restrictions, and minor disturbance to riverbanks, cultural heritage features, and aquatic fauna. Dredging will also generate temporary turbidity, noise, lighting and erosion risks that require strict management. During operations, vessel movements will reduce to near-baseline levels with minimal interaction with community or commercial users, and decommissioning impacts are expected to be short-lived. With mitigation measures, including vessel-speed and wake controls, daylight navigation, coordinated scheduling, community notifications, cultural-heritage protocols, and MARPOL-compliant waste and discharge controls, residual impacts are expected to remain Negligible to Minor, though community concerns regarding impacts associated with dredging and river safety require ongoing engagement and monitoring.

Biodiversity (Terrestrial, Freshwater, Marine)

The Project area contains intact and highly diverse terrestrial, freshwater, and marine habitats including forests, wetlands, mangroves, coral reefs, and seagrass, supporting numerous Critical Habitat (CH)-qualifying species, including some new-to-science, recorded by Project surveys. Construction activities will cause localised habitat loss and disturbance, increased sedimentation, contamination risks, and potential spread of invasive species, with marine impacts including permanent loss of some reef and mangrove areas and possible disruption of migratory pathways. Mitigation focuses on minimising footprint, avoiding sensitive features, species-specific programmes, invasive species control, discharge and sediment management, vessel speed limits, exclusion zones, and long-term monitoring. Most residual impacts will be Negligible to Minor, although Moderate residual impacts will remain for CH-qualifying forest loss, increased sedimentation in nearby tributaries, and marine habitat losses. Moderate to Major residual impacts remain for a small number of very high sensitivity/rare plant species. A long-term biodiversity offset programme will be required to compensate for residual losses and designed to achieve a measurable net gain for all CH-qualifying biodiversity values.

Long term biodiversity monitoring will allow validating the accuracy of predicted impacts and predicted outcomes of the Project's mitigation measures on biodiversity features. The Project has therefore also developed a Biodiversity Monitoring and Evaluation Plan (BMEP) which outlines the set of monitoring requirements and thresholds to implement adaptive management shall it be required.

Ecosystem Services

Baseline surveys identified a wide range of ecosystem services relied upon by local communities, including food, timber, freshwater, fisheries, erosion control, water purification, cultural values, and habitat provision. Project activities may affect these services through vegetation clearing, reduced access to natural resources, water quality changes, and localised impacts on fisheries, while also offering some potential livelihood benefits. Mitigation measures will include optimising and reducing the construction footprint and associated vegetation clearing, Pre-Clearance Surveys (PCS), water quality protection, sustainable resource initiatives, marine safeguards, vessel controls, and ongoing stakeholder engagement. Residual impacts are Negligible to Minor for all provisioning, regulating, and supporting services. These outcomes are associated with Project construction activities, dredging activities, and riverine/marine transport corridors, although impacts remain localised and manageable with ongoing engagement and monitoring. Activities focused on ecosystem services impacted by the Project are likely to also feature within the Project biodiversity offset programme.

Cumulative and Transboundary Environmental Impacts

PNG is a developing country that is well endowed with natural resources. Multiple major projects are in various stages of planning, exploration and operation to develop these resources consistent with the PNG national goals and directive principles. The EIS Vol. 1 Ch. 17 Cumulative Impacts, 2019, hereafter referred to as EIS Cumulative Impacts (2019) undertaken for the EIS (2019) identified six potential impacting processes

from six credible projects that could potentially impact identified key values. The EIS (2019) notes that some of these projects (i.e., the P'nyang LNG Project, the Exxonmobil PNG LNG Facility at Caution Bay and the Project) are inter-related and inter-dependent, relying on transportation and processing facilities operated by partner companies. Onshore, the Project is located in a landscape of intact, well-connected habitats, with the potential for Project impacts to be exacerbated by the cumulative impacts of other credible projects. The Project's contribution to the potential cumulative impacts is predicted to be Minor relative to the credible projects listed, recognising that little publicly available information exists to support a detailed assessment.

The assessment does highlight the following key areas that require PNG Government-led strategies to address the potential cumulative impacts:

- Management of overlapping licence areas and multiple resource extraction activities occurring in PRL-15 and along the Orokolo Bay onshore export pipeline shore crossing.
- Management of impacts on sensitive species, ecosystems and community land use/livelihoods due to land clearing.
- Improvements to economic infrastructure in Gulf Province, and support for business and employment diversification to reduce long-term economic reliance on resource projects.

Key Social Risks and Impacts

Social risks associated with the Project are primarily driven by construction phase activities in a remote, predominantly Indigenous and customary land context, where communities rely heavily on land, riverine and marine resources for their livelihoods, cultural identity and wellbeing. Following application of the mitigation hierarchy, the majority of residual social impacts are assessed as Negligible to Minor, with a limited number of Moderate residual impacts and one Major residual impact remaining. These residual ratings mostly reflect the high sensitivity of affected communities, customary tenure systems and culturally significant locations, rather than deficiencies in Project mitigation.

Residual impacts also persist in relation to Community Health & Safety (CHS), including potential project induced in migration (PIIM) and associated pressures on health services, water and sanitation, and increased risks of gender-based violence and social vulnerability, particularly for women and girls.

Impacts to Indigenous Peoples include ongoing pressure on customary governance structures, social cohesion, and intergenerational transmission of language, cultural knowledge, and traditional practices, driven by employment patterns, income changes, labour influx, and altered access to land and river systems. A Major residual impact to cultural heritage and cultural ecosystem services has been identified at Purivo Junction on the Purari River, where Project-related changes to sandbank morphology intersect with a sacred site of very high cultural sensitivity. No avoidance options were identified by the alternatives analysis. Pre-dredging consultation with affected communities will be undertaken to agree maintenance of access to this site during works. The elevated significance reflects the vulnerability and irreplaceability of the receptor rather than a lack of mitigation.

Livelihood related impacts are predominantly economic displacement, arising from localised and, in some cases, permanent restrictions on access to land, rivers, fisheries, and subsistence resources, with residual impacts assessed as Negligible to Minor following compensation, livelihood restoration planning, and ongoing engagement. Social impact management is therefore centred on avoidance where feasible, sustained FPIC based consultation, implementation of the Cultural Heritage Management Plan (CHMP), targeted community health and safety measures, labour and workforce management, PIIM controls, grievance mechanisms, and adaptive management, recognising that some social impacts associated with permanent infrastructure, demographic change, and highly sensitive cultural receptors cannot be fully eliminated but require long-term, active monitoring and management.

Stakeholder Engagement and Grievance Management

Stakeholder engagement has been undertaken as a continuous, multi-phase process across more than 11 years of Project development, supported by over 13,800 documented engagement records covering upstream, riverine, coastal and peri-urban areas, including government, customary landowners, Indigenous groups and other vulnerable stakeholders. Engagement is delivered through an established Community Relations programme comprising Community Liaison Officers (CLOs), Village Liaison Officers (VLOs), formal community forums, targeted consultations, grievance mechanisms and FPIC/ICP processes, and is closely integrated with land access, livelihood restoration, cultural heritage and impact management activities. The Project operates an established Community Concerns and Grievance Mechanism (CCGM) providing multiple accessible channels for raising and resolving community concerns. Residual risks relate primarily to maintaining stakeholder trust, transparency, meaningful participation and engagement capacity throughout the Project lifecycle, including during peak construction, to ensure effective management of changing Project designs, land access processes, FPIC commitments, grievances and community expectations.

Labour and Working Conditions

The Project will require a large, predominantly temporary construction workforce, peaking at around 6,000 workers, with workforce numbers reducing significantly during operations. Key risks relate to OHS, worker accommodation standards, labour management, and interactions between workers and local communities. The Project has established a labour management framework aligned with IFC PS 2, PNG labour legislation and the Project's Labour and Working Conditions Management Procedure (2025) which is supported by complementary recruitment, grievance, disciplinary, workforce welfare and industrial relations procedures, together with the Project's HSE management system. This framework incorporates measures addressing fair recruitment, worker grievances, codes of conduct, non-discrimination, worker welfare and labour influx management. With these measures in place, residual impacts are assessed as Negligible to Minor, although ongoing management is required to address risks related to workforce influx, gender-based vulnerabilities, fair recruitment, and worker-community interactions.

Community Health and Safety

The main CHS risks arise during the construction phase, driven by sharp increases in road, river, marine, and air traffic, together with dredging and barging activities, communicable disease transmission, and pressure on already-limited health services. Riverine and coastal communities, highly dependent on waterways for transport, livelihoods, cultural practices and access to services, are especially sensitive to these risks. Mitigation measures include comprehensive Community Health, Safety and Security (CHSS) management planning, strengthened emergency response capacity, targeted health awareness programmes, traffic and river-safety controls, and alignment with the Voluntary Principles on Security and Human Rights (VPSHR). With mitigation in place, residual CHS impacts are expected to range from Minor to Moderate. Moderate impacts occurring in specific high-exposure locations during construction and reduce to Minor during operations, though risks associated with PIIM, gender-based violence, and vulnerable groups require ongoing monitoring and sustained engagement throughout the Project lifecycle.

Security

Security risks stem from both existing community security trends and the interaction between security providers (public and private), the workforce, and project-affected communities. In the context of existing vulnerabilities such as limited law and order, land disputes, substance abuse, limited services, pressures from existing in-migration and domestic, gender and sorcery-based violence; the key risks for the Project and communities include the exacerbation of existing trends or emergence of new conflicts, crime or unrest, intimidation or conflict, gender-based violence and harassment. The Project's security framework aligns with IFC PS4 and the VPSHR, including annual security risk assessments, vetting and training of private security

providers, oversight of Government Security Forces (GSF) operating under an MoU, community-focused security engagement, grievance pathways, and integration of human rights expectations into contractor management. Residual security impacts were assessed as part of the EIS (2019). The Project has a community security risk assessment (CSRA) in alignment with PS4 and VPSHR expectations.

Land, Livelihoods and Displacement

Project development requires land and access rights for facilities, pipelines, quarries, roads and logistics corridors, largely within customary land tenure systems. Displacement risk is expected to be predominantly economic, arising from temporary or permanent restrictions on access to land, rivers, fisheries, sago gardens and other natural resources. Physical displacement remains possible in only one location - Pokore Hamlet however this is pending confirmation from further noise assessments. Mitigation will include clan land use compensation, and the development of livelihood restoration and improvement measures tailored to PAoI-specific contexts. Key mitigation instruments, including Land Access and Livelihood Development Plans (LALDPs), define entitlements, compensation values and delivery mechanisms, livelihood restoration, benefit-sharing measures and monitoring indicators. Should physical displacement be necessary at Pokore Hamlet, the Project will follow IFC PS5 and obtain FPIC from both affected households and, where relevant, host communities (IPF 2026) and develop appropriate Resettlement Action Plan (RAP).

ICP and FPIC processes, participatory mapping of restoration measures and ensuring livelihood program implementation includes safeguards for vulnerable groups are intrinsic elements of the ongoing plans. For upstream and coastal communities, the residual impacts on livelihoods regarding land or natural resources access, potential disturbance to ecosystem services and damage of assets have been assessed as Minor or Negligible. Impacts due to economic opportunities have been assessed as either minor or positive.

Indigenous Peoples

Although the Government of Papua New Guinea does not refer to its citizens as Indigenous Peoples, most communities within the PAoI meet the IFC PS7 criteria for Indigenous Peoples. Accordingly, this ESHIA Synthesis uses the term "Indigenous Peoples" in accordance with IFC PS7. Indigenous Peoples are present throughout the PAoI, with strong cultural, spiritual and livelihood connections to customary land, riverine, and marine environments. Risks relate to impacts on customary land and resource rights, cultural identity, decision-making processes, and equitable participation in Project benefits. The Project applies FPIC where applicable, supported by an Indigenous Peoples Framework (2026), hereafter referred to as IPF (2026), an ICP/FPIC Implementation Plan (2025), Land Access and Livelihood Development Plans (LALDPs), cultural heritage management measures and grievance mechanisms integrated with land access processes and livelihood restoration processes. Residual impacts are expected to remain localised and depend on the effective implementation of ongoing ICP/FPIC, inclusive representation, and transparent benefit delivery. They mainly relate to potential erosion of cultural identity and connections to ancestral lands and culturally significant environments arising from land disturbance, environmental change, restricted access and pressure on surrounding communities as a result of PIIM.

Cultural Heritage

Tangible and intangible cultural heritage values are present across the Project area, including sacred landscapes, burial grounds, archaeological sites, ancestral settlements and riverine and coastal cultural sites. Cultural heritage is closely intertwined with indigenous identity, customary land and water tenure, livelihoods and spiritual practices. Cultural heritage sensitivity is highest along the Purari River, Orokolo Bay, and other riverine/coastal corridors, where cultural practices are strongly tied to land–water interfaces and where archaeological material is most prevalent. Risks include disturbance or restricted access to these sites during construction, particularly for pipeline corridors, quarries, dredging, and barging activities. Mitigation is centred on implementation of the Cultural Heritage Management Plan (CHMP) which applies an avoidance-

first approach supported by pre-construction cultural heritage surveys, archaeological salvage where avoidance is not feasible, Chance Finds Procedures, indigenous participation and, where applicable, ICP/FPIC with customary custodians. Residual impacts remain predominantly Minor to Moderate owing to the high sensitivity and irreplaceability of many cultural heritage receptors, even where avoidance, salvage and other mitigation measures are applied. One Major residual impact remains at the Purivo Junction of the Purari River, where temporary changes in sandbank morphology may affect a sacred site. The impact remains significant due to the very high sensitivity of the location rather than inadequate mitigation, and is managed through avoidance where feasible, ongoing consultation, implementation of the CHMP, and adaptive management, enabling intermittent access for cultural practices adapted to construction activities and safety requirements.

Cumulative Social Impacts

Potential cumulative social impacts arise primarily through interaction with other existing and reasonably foreseeable resource developments in the region. These include population in-migration, increased pressure on land, livelihoods, community services and transport corridors, as well as cumulative effects on riverine and coastal resource use, community health, and traditional cultural practices. While the Project's incremental contribution to these cumulative impacts is generally assessed as Minor, effective management will require continued implementation of Project mitigation measures together with coordination between government, industry and other stakeholders to address broader regional development pressures through adaptive management and cumulative impact monitoring.