

## Domain Adaptation to Petronas specific Entities

*This is a compiled document consisting of utterances present across Petronas IPA, showing how the Petronas KM engine can adapt from the open domain to **Oil and Gas entities** of interest, to **Petronas specific entities***

### Level 3: Petronas Entities

- TADR SKDT9 is released to the Baronia field 3 months early, causing the drilling program to incur unanticipated standby costs. Baronia tender drilling campaign drilled four infill wells using the TADR SKDT9. Prior to drilling, the planned BN-14 was replaced by the BN-75 well.
- The contracting strategy for the rig is unknown. This issue remains out of the team's control; it is pending assignation of a PCSB-contracted rig, possibly the Pacific 101 jack-up or an extension of the Aquamarine Driller rig contract, or the tendering of a new rig. Well services will be called off the existing contracts.
- Tukai Timur Phase completed five wells using the Naga 6 jack up rigs. TTA2, TTA5, TTA8, and TTA6 are NAG producers. The fourth well in the program, is a combined NAG producer and appraisal well. During the P&A of the appraisal leg, the project had pressure control issues. Re-establishing pressure control took 31 days.
- Technip has identified two suitable vessels for the shallow water flexible pipelay with known day rates; their availability will be locked-in once work orders are issued.
- Tukai Timur and Baronia are in shallow water offshore Sarawak in the Baram Delta area
- Tukai Timur is an undeveloped NAG field 20km southwest of Lutin, Sarawak, Malaysia at a water depth of 40m to 50m.
- A TAD rig and semisubmersible rig has been contracted and scheduled for the drilling program. The actual rig that will perform the drilling has not yet been identified. The joint efforts between the drilling department and master integrated schedule (MIS) group has for the drilling program and will allocate a suitable rig according to the specifications provided by the team. The team plans for batch drilling. Individual well AFEs have yet to be prepared and approved. Detailed data acquisition plans have yet to be finalized. The team has scheduled the drilling around the monsoon season (November to March).
- Well Construction Duration and Cost Analysis Methodology
  - Drilling duration model considers drilled footage, complexity of casing design, well path complexity, and batch drilling
  - Completion duration model considers completion depth, tree type complexity, batch drilling, and completion complexity (multi-zone, multi-lateral, sand control, etc.)
- This evaluation of the Angsi-D Development Project compares the project's performance with that of similar projects in Industry and with Petronas average performance. As the project facilities scope is complete, we also compare the project facilities actual performance with the estimates provided at sanction. Inputs were Assumed, which lags

the Best Practical rating of Definitive for greenfield developments. The subsurface team had sufficient logs and 3D seismic data across the field for the Angsi-D. The core data were obtained from side-wall cores in the Angsi-B area; therefore, the project team had to infer the Angsi-B porosity and permeability properties. As mentioned in the Appraisal section, the team drilled one appraisal well (Angsi-8), which provided the fluid content, structure, and stratigraphy data. Well tests were not conducted.

- Project Types Greenfield Project to develop a new field Brownfield Project to expand production in an existing field/development Colocated Project located adjacent to an existing facility, but standalone except for utilities Revamp Project to rebuild/refurbish an existing operation Schedule-Driven Projects for which a pressing need to execute quickly exists. Overtime for engineering and construction and expediting equipment and parts delivery are often used, as well as unusually high phase overlap (e.g., of engineering and construction).
- However, alignment was sought with PGB through a discussion of the project design premise during the kick-off.
- Project Background Business Objectives:
  - Ensure sufficient regasification capacity to meet the long-term energy demand for Refinery and Petrochemical Integrated Development (RAPID) Project, the Pengerang Cogeneration Plant (PCP), and the Peninsular Gas Utilization Grid Project.
- Kumang Cluster fields are located approximately 200 km offshore Bintulu, Sarawak, with water depths ranging from 59 m to 102 m in sub-blocks SK 308, 313, and 315. Kumang Cluster gas fields, at the time of project sanction consisted of ten (10) gas reservoirs: Kanowit, F9, Kumang, F22, F12, F27, F11, A3, Selar Marine, and Bunga Pelaga. These reservoirs were planned to be developed in two phases. Phase 1 development consists of Kanowit, F9, and Kumang fields East section only (the West section was planned for Phase 2). The total resource promise for all reservoirs was about 2.7 trillion cubic feet (Tcf) of gas, to be recovered by 23 development wells. Current plans for further development are limited to infill drilling on F9 only with other prospects failing to meet economic hurdle rates due to lower reserves expectations. Since then six more fields have been added with an estimated ultimate recovery of 6.6 Tcf.

## **Level 2: Oil and Gas Entities**

- BARDEGG-2 aims to develop the remaining non-associated gas resources in the Baram Delta area (Tukau Timur and Baronía NAG) to support BDO EOR development, and provide long term supply to the Bintulu LNG complex and condensate supply to MCOT. Baronía EOR aims to increase the oil production from the Baronía oil field through infill drilling, hydrocarbon gas injection and water injection.
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## Level 1: General Entities

- After competitive bidding and project authorisation, the EPC contract for the facilities scope was awarded to Kencana Holding (KHL). This was the first time that KHL was working in East Malaysia. However, KHL was familiar with the PCSB work process through previous work in Peninsular Malaysia. As KHL did not have a fabrication yard in the area, a yard was rented from Oceancare in Labuan.
- The KNAG field is located in Sub-Block 6S-23 in SB-1 PSC, 55 km northwest of Labuan offshore Sabah at a depth of 54 m. In addition to the KN East and KN West reservoirs, un-appraised KN Ultra Deep reservoirs exist at depths of 4,800 m and deeper. The KN West reservoirs straddle the Malaysia-Brunei border. The KNAG Development Project was a schedule driven project, and is part of the Sabah and Sarawak Integrated Oil and Gas Project (SSIOGP). The estimated 1,031 billion cubic feet (bcf) of gas, or 178 million barrels of oil equivalent (MMBOE), will be conditioned 3 Megaprojects are classified as projects with a capital expenditure exceeding US\$ 1 billion. 4 KN West was formerly known as the KN Deep.
- The SMRG 2 AD Project main objective was to accelerate development under the Petroleum Management Unit (PMU) Crude Oil Initiative (COIN) 2012 Program. Its specific objectives included: (1) to achieve first oil in Q4 2012 (however, the team committed to management first oil in Q1 2013); and (2) to produce a total of 2.2 million barrels (MMbbl) of oil by 2020 and at a stabilized production rate of 1,050 barrels of oil per day (bopd) from three infill drilling wells.