ONSHORE PIPELINES DECOMMISSIONING GUIDELINE

1. INTRODUCTION

After concession is expired or at the end of its economic life, pipeline network and all associated structures are due for decommissioning unless there is sufficient reason to deferral. Onshore surface pipelines and associated structures are required to totally remove or reuse in situ if their conditions meet the set criteria for the new purpose.

The subsurface pipelines should be decommissioned in such a way that is determined by BPEO tool. A key environmental issue for pipeline is the contaminants inside the pipeline, which require effective cleaning and/or decontamination. Pre-decommissioning monitoring requires historical data accumulated during production monitoring to be baseline data for post-decommissioning monitoring which aims to ensure no harm to the environment or other land users by verifying decontamination procedures and mitigation measures adopted.

Stakeholders including land owner play an important role in onshore decommissioning, so concessionaire should engage and take their opinion into consideration in the earlier planning stage.

2. OBJECTIVES, GENERAL APPROACH AND PLANNING

2.1 Objectives

The objectives of this guidance are:

- To ensure compliance with international treaties, conventions and Thai legislation;
- To provide the decision criteria that shall enable concessionaires to determine the likelihood of the approved recommended management options.

2.2 Approach

- The method of decommissioning should be assessed by performing a site specific investigation to establish the differing conditions along the right-of-way (ROW). The Best Practical Environmental Option process, supported by a suitable environmental assessment, will assist in determining the preferred option(s).
- Cumulative impacts from the concessionaire’s total onshore pipeline network within a particular field should be considered when assessing the significance of any potential impacts.

2.3 Planning

- Stakeholder consultation should be initiated at the early stages of the decommissioning planning phase.
- The planning schedule must give the opportunity to ensure all key stakeholders (landowners and government authorities) have been consulted and any significant issues or concerns are considered in the decision-making process.
- The timing of the decommissioning should consider the seasons in respect to removal, agricultural activities or re-plantation in order to minimize potential impacts or facilitate restoration.
- Safety and environmental management plans should be developed to ensure the key issues identified during the site specific assessment are addressed in the implementation phase.
3. SCOPE OF GUIDANCE

This guidance covers the onshore oil and gas pipeline network and all associated structures in the Kingdom of Thailand governed by the Petroleum Act B.E. 2514; this guidance therefore excludes PTT pipelines.

4. IMPLICATIONS FROM AGREED ENVIRONMENTAL POLICIES AND PRINCIPLES

The environmental principles stated in Article 5.1: Environmental Principles shall have the following implications with regards to pipeline decommissioning:

- In the event of uncertainty, with regards to decontamination of pipelines, the decommissioning option will err on the side of caution by including a comprehensive and extended monitoring plan.

- At the time of drafting this guideline, the methods for pipeline decontamination is still under research. Development of any such environmental technologies should be performed in a process to ensure diffusion of knowledge and development of practical techniques and procedures for the benefit of protecting the environment in a cost effective manner.

- All available environmental data should be made available to stakeholders upon request through the designated authorities. Stakeholders will have the right to comment on the Draft Regional Decommissioning Environmental Assessment (RDEA) report and have their comments integrated into the final RDEA report and Best Practical Environmental Option (BPEO) assessment to ensure public acceptability is addressed as part of the decision-making criteria. The comments should be addressed to the extent that they are relevant, valid and factually accurate.

5. INTERNATIONAL AND REGULATORY FRAMEWORK

There are no specific international conventions directly related to onshore decommissioning of pipelines. However, the Convention on Biological Diversity and Ramsar Convention may apply depending on the location of the pipelines.

As with offshore pipelines the relevant Thai legislation, in the form of Ministerial Regulations, the Thailand Petroleum Act BE 2514 and the Enhancement and Conservation of National Environmental Quality Act, B.E. 2535, refer to prevention, control of pollution, restoration and decentralization of environmental authorities.

6. DESCRIPTIONS

6.1 Decommissioning Deferral

When a pipeline becomes due for decommissioning and due to technical and/or economical reasons it is desired to defer the decommissioning, then this pipeline together with reasons of deferral should be clearly stated in the Initial Decommissioning Program for approval by designated authority.

If the pipeline is to be suspended for deferral or further future use it should be appropriately protected against corrosion both internally and externally using environmentally friendly methods.

Suspended pipelines should be isolated from the remaining network and sufficient provisions should be made for future cleaning and/or decontamination, if required. An appropriate maintenance and survey regime should be implemented to ensure the minimum risk to environment.
6.2 Pipeline Information Requirements

To determine decommissioning option, the specified information in the following sub-sections should be made available.

If sufficient historical data is not available then the concessionaire will be required to obtain the missing information by performing the relevant surveys, where practical.

6.2.1 Technical Specifications:

Inventory information describing: length; depth; diameter and wall thickness; material; type of service (oil, gas, multi-phase); fluid composition (from well head); corrosion coating; remaining life of cathodic protection; design structural life; associated surface structures and/or valve assemblies.

6.2.2 Historical Data:

Best efforts should be made to compile a summary of historical records on the following:

- Installation period;
- Pipeline route map (topographic and aerial or satellite images);
- Original condition of right-of-way (RoW);
- Land use map;
- Documented as-built information;
- Landowner RoW agreements;
- Recent inspection and corrosion records; and
- Damage and repairs during pipeline life.

6.2.3 Surveying Requirements (if not available in historical data):

Recent aerial photos or satellite images; present condition of RoW, (erosion, vegetation cover and land use) and pipeline corrosion report.

In case of pipeline leaving in-situ, concessionaires should include above pipeline information in an Appendix of the Closeout Report for Decommissioning for the benefit of monitoring design and to ensure records of them can be updated into marine navigation and fishing charts.

6.3 Decommissioning Options

A pipeline network (trunk and in-field lines) may require decommissioning using one or a combination of options, as determined by the conclusions of a site specific assessment.

6.3.1 Reuse

If an opportunity for reuse can be identified, a preliminary assessment should be performed to evaluate its feasibility.

When assessing the reuse of pipelines in situ, the concessionaire should consider, but not be limited to, the following:

- The pipeline design life along with structural condition and integrity;
- The cleanliness of the pipe; and
- The transfer of liabilities.

When assessing the opportunities for reuse of pipeline material, the cleanliness and treatment of any contaminants should be in accordance to the Notification of Ministry of Industry B.E. 2548 with regards to industrial waste disposal.
6.3.2 Leave in in-situ

Due to the impact associated with removing buried pipelines, it is expected that most subsurface pipelines will be left in situ subject to, but not limited to, the following conditions:

- The pipeline has been flushed and cleaned in accordance to 6.4.1 and if required, decontaminated to the recommended levels and the verification process is followed as per 6.4.2 and 6.4.3 respectively.
- Publicity to the relevant local authorities must be given with regards to depth, position, size and condition of any pipelines left in situ to ensure the pipelines do not become an obstruction or hindrance to any future land management activities and utilities;
- Where applicable, suitable measures (such as cement plugs) are taken in sloping areas to ensure the pipeline does not become a conduit for water;
- Best Available Technology are used in the appropriate areas to prevent the risk of future subsidence or erosion (road crossings, water crossings, steep slopes);
- It is accepted by the designated authorities, in consultation with landowners, with the precondition that a Re-plantation and Reinstatement Plan together with a monitoring and audit program is prepared and implemented to ensure the process to complete remediation.

6.3.3 Removal

Surface Pipelines - All surface pipelines and associated surface structures should be removed and the RoW should be reinstated to its original condition, as far as practically possible, and accepted by key stakeholders identified in the BPEO process.

Subsurface Pipelines - Subsurface pipelines will predominantly be decommissioned in situ as accepted by key stakeholders identified in BPEO process. However, if sections of the pipeline are proved to be an obstruction to near future land use (such as canals, piling, foundations etc.,) partial removal should be considered as an option.

Any such items should be cleaned to a level which is safe for handling and transportation.

The treatment and final destination of all removed pipelines, associated structures and residual wastes should be carried out in as recommended in the Waste Management Guidelines (Attachment P).

6.4 Pipeline Cleaning and Decontamination Requirements

All pipelines should be cleaned and will also require decontamination if contaminants are found by the presence of impurities in the fluid properties and/or the presence of contaminants in the hydrocarbon cleaning residue.

A project specific “Cleaning and Disposal Plan” and/or “Decontamination and Disposal Plan” should be prepared as part of the DEMP as described in Environmental Policies and Management Recommendations (Attachment A) in consultation with designated authorities.

6.4.1 Cleaning Requirements

Prior to disconnection, isolation and/or removal, all pipelines should be pigged and purged to flush residual fluids and residues using the Best Available Technology (BAT) to ensure effective cleaning.
A project specific “Cleaning and Disposal Plan” should be developed and submitted to the designated authorities for acceptance detailing the following:

- The historical information of the pipeline (fluids composition, operating and maintenance records);
- Details of the water source, equipment, chemicals and techniques used for purging (gases) and/or scraping (solids);
- The measures taken to contain solid and liquid wastes and prevent spills during the cleaning process and/or the disposal methods of hydrocarbon gases (venting or flaring);
- The management (analysis, treatment, transportation and final disposal destination) of residual wastes from the cleaning process, in accordance with the Waste Management Guideline (Attachment P).

### 6.4.2 Decontamination Requirements

Although the chemical technology to leach out or encapsulate contaminants is available there are no definitive field studies in Thailand to prove the practicality of any of the methods. Research projects have been initiated to evaluate these and other developing technologies. This section of the guidelines will be updated when the results of these research projects and field and/or laboratory trials are concluded.

Any decommissioning application with regards to contaminated pipelines, prior to the update of this section, should include a project specific “Decontamination and Disposal Plan” and consist of, but not be limited to, the following:

- Type of contaminated materials & residues;
- The method of decontamination and the types of chemicals used;
- The equipment and storage capacity to contain decontamination fluids and wastes;
- Mitigation measures to minimize potential environmental impacts; and
- The management and final disposal destination of residual wastes from the decontamination process.

### 6.4.3 Verification

Cleaning and/or decontamination of pipelines should be verified by using a qualified third party, as specified in Third Party Auditor/Consultant Qualification Guideline (Attachment U).

To verify the cleaning process,

- For pipeline to be further decontaminated, the final flushed water discharged from the pipeline should have no visible sheen.
- For pipeline to be left in situ but no decontamination required, the concentration of oil and grease in the final flushed water discharged from the pipeline should be below or equal to 15 ppm.

To verify the decontamination process the allowable concentrations of heavy metals, where relevant, monitored in the internal fluid should be below or equal to Soluble Threshold Limit Concentration (STLC) referred to in Annex II, **Notification of Ministry of Industry B.E. 2548 (2005)** regarding waste disposal.

If the decontamination techniques fail to bring the levels within the prescribed limits, alternative pipeline management options will be considered on a case by case basis in consultation with the designated authorities.
The cleaning and/or decontamination results should be documented in the Closeout Report for Decommissioning.

6.5 Key Environmental Issues

The level of environmental concerns will vary depending on the site specific conditions. The key environmental issues identified with onshore pipeline decommissioning are, but should not be limited to:

- Landowner and local administrative consultation;
- Pipe cleaning and decontamination;
- Environmental management and disposal of waste water and residues;
- Land use management and land rights;
- Ground subsidence;
- Erosion; and
- Creation of water conduits;

These issues should be addressed as part of the environmental assessment and followed up as management plans to ensure the mitigation of any potential social and environmental impacts.

6.6 Monitoring Requirements

A two phase monitoring program should be applied as followed: pre-decommissioning and post-decommissioning monitoring.

6.6.1 Pre-decommissioning Monitoring

Historical and survey data, as specified in 6.2.1 and 6.2.2, should be analyzed to determine the condition of the pipelines and RoW. If recent data is unavailable, a survey should be performed to assess the specific areas along the ROW requiring particular attention. This will be required prior to decommissioning to support the overall decommissioning plan.

6.6.2 Post-decommissioning Monitoring

The aims of the post-decommissioning monitoring are:

- To monitor the effectiveness of the re-plantation and restoration performed and support the verification process for complete reinstatement of the ROW;
- To support the effectiveness of any alternative management options, if adopted;
- To ascertain the period of liability and responsibility along the RoW.

Details of the monitoring requirements will be evaluated by the designated authorities on a case-by-case basis and follow the recommendations and parameters specified in Onshore Structures & Facilities Decommissioning and Environmental Remediation Guideline (Attachment G).

6.7 ENVIRONMENTAL AUDIT

An environmental audit will be required using a qualified third party and in consultation with the designated authorities, to ensure compliance with the post-decommissioning monitoring and to confirm and document adherence to the project specific management plans detailed in Environmental Policies and Management Recommendations (Attachment A). The audit report should be included in the Closeout Reports.