

平成 22 年 9 月 2 日
独立行政法人 日本貿易保険

環境レビュー結果

- (1) 照会番号
09-031
- (2) プロジェクト名
石油精製製品の製造・販売
- (3) 実施場所
サウジアラビア ジュベイル
- (4) プロジェクト概要
石油精製製品の製造及び販売
- (5) カテゴリ分類
カテゴリ A
- (6) カテゴリ分類の根拠
環境ガイドラインに示される石油精製セクターに該当し、影響を受けやすい地域（生態学的に重要な生息地）を伴うため。
- (7) 環境許認可
現地国環境関係制度に基づき環境影響評価を含む建設関連資料が作成され、サウジアラビア国王立委員会より許認可を取得済である（2009 年 2 月）。
- (8) 汚染対策
各施設において対策が講じられ、大気については現地基準を満足し、国際基準を概ね満足する計画である。排水については現地基準を満足するよう工業団地共用設備で計画であり、騒音については現地基準及び国際基準を満足する計画である。その他の汚染対策についても適切に対策が講じられ、特段の問題は予見されない。
- (9) 自然環境面
本プロジェクトサイト及び周辺に現地国法令または国際条約等に定める保護対象地

域等は存在しない。周辺に生態学的に重要な生息地が存在するが、十分な距離があり、特段の影響は予見されない。

(10) 社会配慮面

本プロジェクトにより住民移転等は発生しない。

(11) その他（モニタリング等）

サウジアラビア国王立委員会の指定する項目（排水、大気質、騒音等）に関するモニタリングが実施され、サウジアラビア国王立委員会に報告される。

以 上

Questions

Q1. Please provide the address of the project site.

Address of the project site : the Industrial City of Jubail 2 – Kingdom of Saudi Arabia

Q2. Please provide brief explanation of the project.

The JRPP represents the design, construction, commissioning and operations of a grass roots refinery capable of processing 400,000 barrels per Stream Day (BPSD) of Arabian Heavy crude oil to produce gasoline, diesel, jet fuel, paraxylene, fuel oil and petroleum coke for export and liquid sulphur, propylene and benzene products for domestic consumption or further processing.

The JRPP will be located in Saudi Arabia on the west coast of the Arabian Gulf, within the Industrial City of Jubail 2 (about 3 km west of the existing industrial JIC) in the PLOT 9 area.

The JRPP can be considered to comprise three elements:

- The refinery (which includes processing units, utilities, and the feed crude / product storage);
- Export facilities, located in the King Fahad Industrial Port, which includes buffer product storage and their connection to loading berths; and
- Interconnecting pipelines and coke conveyors from the refinery to either KFIP or the respective tie-in points for locally delivered products.

Q3. Will JBIC loan be applied to a new project or an executing project? In case of executing project, please inform the presence of strong claims by local residents.

- | | |
|--|---|
| <input checked="" type="checkbox"/> New Project | <input type="checkbox"/> Executing Project (with Claim) |
| <input type="checkbox"/> Executing Project (without Claim) | <input type="checkbox"/> Others(Please specify) |

Q4. In case of this project, is it necessary to execute Environmental Impact Assessment (EIA) based on the laws or regulations? If necessary, please inform the progress of EIA.

- | | |
|---|---|
| <input type="checkbox"/> Required (Completed) | <input type="checkbox"/> Required (Under execution or under planning) |
| <input checked="" type="checkbox"/> Not Required (for local regulation) | <input checked="" type="checkbox"/> Others (required for Financing parties) |

Q5. In case that EIA is already completed, please inform whether EIA report is already approved based on the environmental assessment system or not. If EIA report is already approved, please provide the date and name of authorities of the approval.

- | | |
|---|---|
| <input type="checkbox"/> Approved (without condition) | <input type="checkbox"/> Approved (conditional) |
| <input type="checkbox"/> Under approval process | <input checked="" type="checkbox"/> Others (Not required by Local regulation) |

Date of Approval : _____

Name of Authorities : _____

Q6. If environmental permit(s) other than EIA is required, please provide the name of required permit(s). Have you obtained required permit(s)?

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Obtained | <input checked="" type="checkbox"/> Required, but not obtained yet |
|-----------------------------------|--|

☐ Not required

☐ Others (Please specify

)

Name(s) of required permit(s) : Environmental Consent to Construct and Environmental Permit to Operate (RCER 2004 – Volume II)

Q7. Will the loan be used for the undertaking that cannot specify the project at this stage (e.g. export or lease of machinery that has no relation with specific project, or Two Step Loan that cannot specify the project at the time of loan agreement)?

(No)

If you answered “Yes”, it is not necessary to reply to the following questions.
If you answered “No”, please reply to the following questions.

Q8. Are there any environmentally sensitive area shown below in and around project site?

(Yes)

There are no National designations within the immediate area of the proposed JRPP (including the port and the pipelines). A marine wildlife sanctuary which would include some terrestrial habitat around Jubail has been proposed by the National Commission for Wildlife Conservation and Development, the Saudi Agency responsible for wildlife protection. This has not been formally ratified by the Government (and is extremely unlikely to be), but does have rangers and staff present conducting research and survey work. This is over 10km to the north of the JRPP site.

Sabkhat Al Fasl Lagoons is the area where Jubail Industrial City discharges its treated effluent during winter months. This has created a valued wetland habitat for birds and has been identified as an Important Bird Area by Birdlife International. This is approximately 8km to the north of the JRPP site.

There are no other known designations, environmentally, socially or historically sensitive areas within the location of the work.

If you answered “Yes”, please select applicable items by marking, and reply to following questions.

If you answered “No”, please reply to questions 9 and after.

- ☐ (1) National parks, protected areas designated by government (coastal areas, wetlands, habitats of minorities or indigenous populations, heritage sites, etc.)
- ☐ (2) Primeval forests, tropical natural forests
- ☒ (3) Ecologically important habitats (coral reefs, mangrove, tidal flats, etc.): Important Bird Area¹ - Sabkhat Al Fasl Lagoons approx 8km to the north of the JRPP site (The proposed marine wildlife sanctuary is not designated and is much further to the north - focused on Abu Ali Island)
- ☐ (4) Habitats of endangered species of which protection is required under local laws and international agreements.
- ☐ (5) Areas that have risks of large scale increase in soil salinity or soil erosion
- ☐ (6) Desertification areas
- ☐ (7) Areas with special values from archaeological, historical and/or cultural viewpoints
- ☐ (8) Habitats of minorities, indigenous populations, nomadic people with traditional life style, or areas with special social value

Q9. Does the project involve following elements?

(No)

If you answered “Yes”, please describe the scale of applicable elements, and reply to the questions 10 and after.
If you answered “No”, please reply to questions 11 and after.

☐ (1) Involuntary resettlement (Number of resettlers:)

- ☐ (2) Pumping of groundwater(Scale: ton/year)
- ☐ (3) Land reclamation and/or development (Scale: ha)
- ☐ (4) Deforestation (Scale: ha)

Q10. Please reply to this question only in case that the project involves some of the above (1) to (4) elements. In the country where the project is planned, are there any regulations on a scale of the elements asked in question 9? If the country has such regulation, please answer whether the project satisfies the regulation or not.

- ☐ Regulation is applicable (☐ satisfied ☐ not satisfied) ☐ No regulation
- ☐ Others (Please specify)

Please reply to questions 11 and after.

Q11. Will JBIC share in the project be equal or less than 5% of the total project cost, or the total amount of JBIC loan equal or less than SDR 10 million?

(No)

If you answered "Yes", it is not necessary to reply to the following questions.
If you answered "No", please reply to questions 12 and after.

Q12. Does the project belong to either of the sectors that impact on the environment is deemed immaterial or is not anticipated under normal conditions (e.g. maintenance of the existing facilities, non-expansory renovation project, acquisition of rights or interest without additional plant investment)?

(No)

If you answered "Yes", it is not necessary to reply to following questions.
If you answered "No", please reply to the questions 13 and after.

Q13. Does the project belong to the following sectors?

(Yes)

If you answered "Yes", please specify the sector by marking, and reply to questions 14 and after.
If you answered "No", it is not necessary to reply to the following questions.

- ☐ (1) Hydro power plant, Dam or water reservoir
- ☐ (2) Thermal power plant
- ☐ (3) Mines
- ☐ (4) Development of oil and gas
- ☐ (5) Pipeline
- ☐ (6) Steel industry (with large scale furnace)
- ☐ (7) Non-ferrous metal refining
- ☐ (8) Petrochemical (including manufacturing of raw materials and petrochemical complex)
- ☐ (9) Terminal of oil, gas and chemicals
- ☒ (10) Petroleum refining
- ☐ (11) Paper and pulp
- ☐ (12) Manufacturing and/or transportation of hazardous substances (specified by international agreement)
- ☐ (13) Road, railway or bridge
- ☐ (14) Airport

- ☐ (15) Port
- ☐ (16) Waste material processing or treatment
- ☐ (17) Treatment of sewage and/or waste water that includes hazardous substances or executed at environmentally sensitive area
- ☐ (18) Power transmission and/or distribution lines (including large scale involuntary resettlement, large scale deforestation or submarine cable)
- ☐ (19) Tourism (Construction of hotel, etc.)
- ☐ (20) Forestry or tree planting
- ☐ (21) Agriculture (large scale project and/or project including irrigation)

Q14. Please provide information on the scale of the project (project area, area of plants and buildings, production capacity, amounts of power generation, etc.) Further, please explain whether an execution of EIA is required on account of the large scale of the project in the country where the project is implemented.

The national permitting system for the Industrial city of Jubail does not require the preparation of an EIA. However the project has volunteered to prepare an ESIA to support Project Financing and to fulfill the Export Credit agencies and commercial banks' requirement in relation to environmental and social matters (IFC Performance Standards and Equator Principles).

See attachment.

A) Refinery Production rates:

Products (excluding internal fuel)	Quantities **	
	% weight	KTA
LPG (propane/butane)	0.9%	186
Propylene (Polymer Grade)	1.0%	205
Benzene	0.7%	146
Paraxylene	3.4%	720
Regular gasoline (10 ppm)	12.8%	2,712
RBOB gasoline* (10 ppm)	6.6%	1,400
Jet/Diesel (10 ppm)	54.5%	11,548
Liquid sulphur	2.2%	471
Petcoke	10.1%	2,146

*Reformulated Blendstock for Oxygen Blending (RBOB)

**Based on 365 days – in % of Arabian Heavy crude and natural gas processed

Unit / Utility	Description
Crude Desalting	Washes the feed crude oil prior to atmospheric distillation.
Crude Distillation	Distils crude oil into boiling point 'fractions', including fuel gas, kerosene, naphtha, heavy / light gas oil, and residual bottoms (for vacuum distillation). Each 'cut' undergoes further treatment.
Vacuum Distillation	Further distils residual bottoms after atmospheric distillation to light vacuum gas oil, vacuum gas oil, and vacuum residual bottoms.
Naphtha Hydrotreater	The purpose of the unit is to treat naphtha from the atmospheric distillation and coker units in order to reduce sulphur and nitrogen content to 0.5 wt ppm as well as to saturate olefins of coker naphtha. Feed streams are heated and passed over a catalyst in the presence of hydrogen. This unit includes also a debutanizer which produces LPG and stabilized naphtha. A further splitter will separate stabilized naphtha into light (to storage) and heavy (to feed the Catalytic Reformer Unit) fractions.
Continuous Catalytic Regeneration Reformer	<p>The purpose of the Catalytic Reformer Unit is to produce, starting from heavy naphtha, heavy reformate, light reformate, hydrogen rich gas (for use in paraxylene and other units) and LPG.</p> <p>Reformate splitter will separate a benzene rich cut and a heavy</p>

Unit listing and overview of process;

Unit / Utility	Description
Crude Desalting	Washes the feed crude oil prior to atmospheric distillation.
Crude Distillation	Distills crude oil into boiling point 'fractions', including fuel gas, kerosene, naphtha, heavy / light gas oil, and residual bottoms (for vacuum distillation). Each 'cut' undergoes further treatment.
Vacuum Distillation	Further distills residual bottoms after atmospheric distillation to light vacuum gas oil, vacuum gas oil, and vacuum residual bottoms.
Naphtha Hydrotreater	The purpose of the unit is to treat naphtha from the atmospheric distillation and coker units in order to reduce sulphur and nitrogen content to 0.5 wt ppm as well as to saturate olefins of coker naphtha. Feed streams are heated and passed over a catalyst in the presence of hydrogen. This unit includes also a debutanizer which produces LPG and stabilized naphtha. A further splitter will separate stabilized naphtha into light (to storage) and heavy (to feed the Catalytic Reformer Unit) fractions.
Continuous Catalytic Regeneration Reformer	The purpose of the Catalytic Reformer Unit is to produce, starting from heavy naphtha, heavy reformat, light reformat, hydrogen rich gas (for use in paraxylene and other units) and LPG. Reformat splitter will separate a benzene rich cut and a heavy reformat.
Benzene Extraction	Based on extractive distillation using the Morphyane Process, the benzene rich cut from reformat splitter will be separated into benzene, light raffinate and toluene.
Paraxylene Unit	The unit applies the 'Eluxyl' process to produce high purity paraxylene, with toluene being produced as a side product. The Eluxyl process is based on the adsorption of a mixture of xylenes upon a selective adsorbent with a desorbent carrier.
High and Low Pressure Hydrodesulphurization	Catalytic processes to reduce the sulphur content of feed streams (kerosene, light and heavy gasoil).
Mild and Distillate Hydrocracker	Hydrocracking upgrades heavier fractions into lighter, more valuable products.
Fluid Catalytic Cracking (FCC)	Upgrades heavier fractions into lighter, more valuable products.
LPG Selective Hydrogenation	LPG fraction from FCC and coker is heated with hydrogen in a reactor to selectively hydrogen the diolefins. It will be followed by a debutaniser which will produce LPG and naphtha.
Unsaturated Gas Plant	This unit includes a Depropanizer and Deethanizer Section, followed by Propane / Propylene Splitter Section to separate: <ul style="list-style-type: none"> o A C4 cut as a product stream going to the Selective Hydrogenation Unit; o Light hydrocarbons (C2s) going to the fuel gas system; o A high purity propylene (polymer grade); and o A propane rich stream going to the fuel gas system. This unit also includes a propylene purification section to remove impurities, water and arsine, in order to reach the required purity for Polymer grade Propylene.

Unit / Utility	Description
Alkylation	Light olefins (propylene, butylenes and/or amylene) are reacted with isobutane in the presence of a sulphuric acid catalyst to form alkylate. The alkylate product is a mixture of gasoline boiling range branched hydrocarbons which is blended with the refinery gasoline pool to increase the gasoline octane and reduce the vapor pressure.
Sulphuric Acid Regeneration	Sulphuric acid regeneration involves four steps: (1) Formation of sulphur dioxide by the decomposition of spent acid and the combustion of H ₂ S gas. (2) Cooling and purification of the sulphur dioxide process gas. (3) Conversion of sulphur dioxide to sulphur trioxide. (4) Absorption of sulphur trioxide in sulphuric acid.
Saturated Gas Plant	Purpose is to fractionate feed from the naphtha hydrotreater into mixed propane / butane LPG, naphtha and an overhead fuel gas stream for the refinery fuel gas network.
Hydrogen Making Unit	Generates hydrogen by steam reforming of butanes and light naphtha. Produced hydrogen is purified by Pressure Swing Absorption (PSA) prior to use within the refinery. Hydrogen is used in the process of hydrotreatment and hydrogenation of certain product streams.
Sulphur Recovery Unit (SRU) and Tail Gas Treatment (TGT).	Converts H ₂ S to liquid sulphur in a Claus Reactor, the following TGT will capture residual sulphur compounds achieving a total higher efficiency in sulphur removal.
Amine Regeneration	'Rich' amine, which has recovered H ₂ S from a fuel gas stream, is regenerated by heating. H ₂ S generated by this process is transferred to the SRU.
Sour Water Stripper	This unit removes H ₂ S and NH ₃ from various sour water streams.
Delayed Coker Unit (DCU)	Delayed Coking is a thermal process in which a residuum material is rapidly heated in a furnace and then thermally cracked in coke drums. Products from the coking include overhead vapours, unstabilised naphtha, Light Coker Gas Oil (LCGO), Heavy Coker Gas Oil (HCGO), and Petroleum Coke.
LPG Merox	Merox unit treats LPG, kerosene or jet fuel by oxidizing mercaptans to organic disulfides.