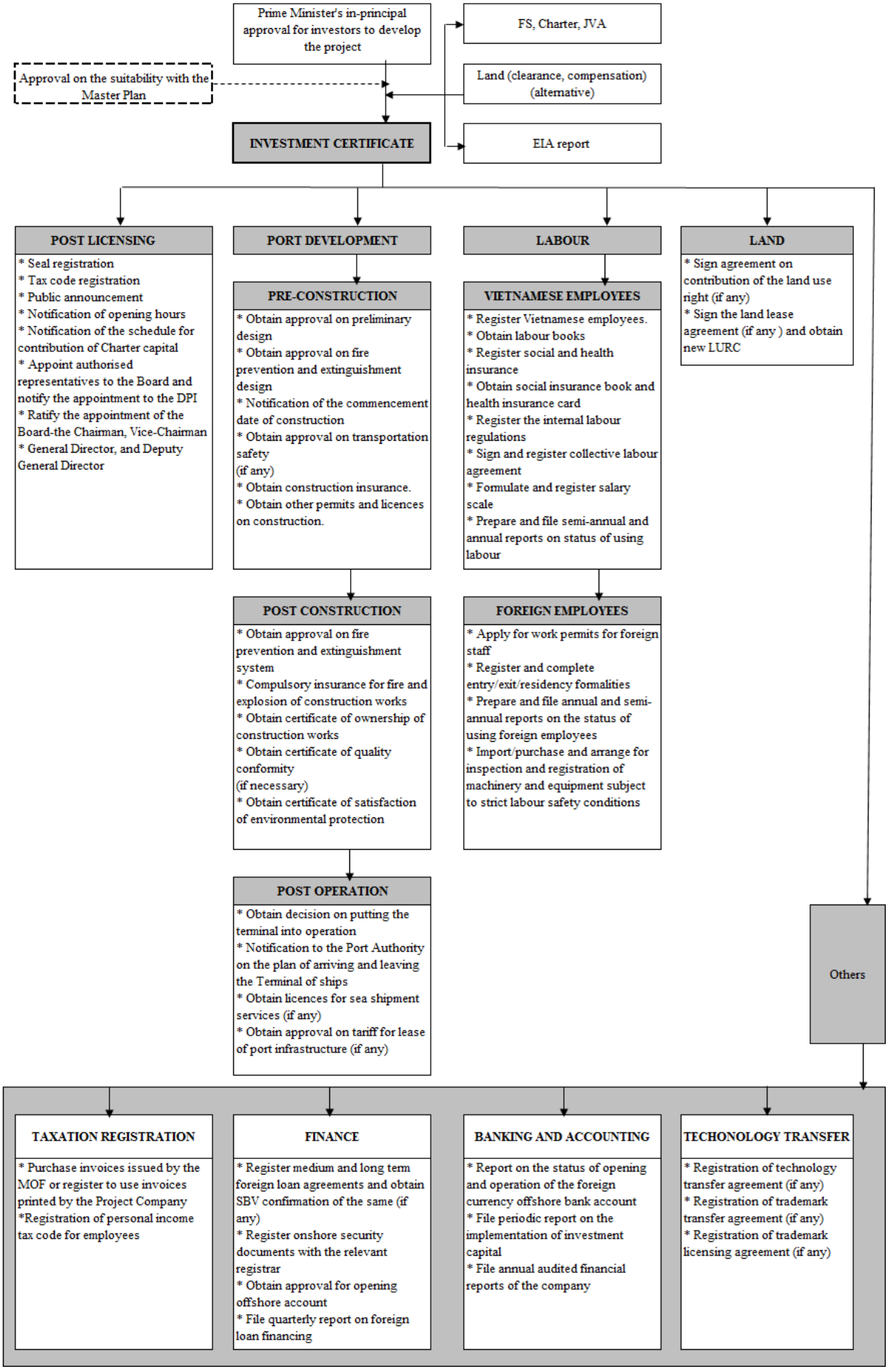
Part 3. Common Contents

Chapter 13. Concerned Local Laws and Regulations

13.1. General Legal Framework

(1) There are primary laws and regulations related to the Coal Transshipment Terminal (CTT) Project, as follows.


Prime Minister's in-principal approval for investors to develop the project
FS, Charter, JVA
Approval on the suitability with the Master Plan
Land (clearance, compensation) (alternative)
INVESTMENT CERTIFICATE
EIA report
POST LICENSING
* Seal registration
* Tax code registration
* Public announcement
* Notification of opening hours
* Notification of the schedule for contribution of Charter capital
* Appoint authorised representatives to the Board and notify the appointment to the DPI
* Ratify the appointment of the Board-the Chairman, Vice-Chairman
* General Director, and Deputy General Director
PORT DEVELOPMENT
PRE-CONSTRUCTION
* Obtain approval on preliminary design
* Obtain approval on fire prevention and extinguishment design
* Notification of the commencement date of construction
* Obtain approval on transportation safety (if any)
* Obtain construction insurance.
* Obtain other permits and licences on construction.
POST CONSTRUCTION
* Obtain approval on fire prevention and extinguishment system
* Compulsory insurance for fire and explosion of construction works
* Obtain certificate of ownership of construction works
* Obtain certificate of quality conformity (if necessary)
* Obtain certificate of satisfaction of environmental protection
POST OPERATION
* Obtain decision on putting the terminal into operation
* Notification to the Port Authority on the plan of arriving and leaving the Terminal of ships
* Obtain licences for sea shipment services (if any)
* Obtain approval on tariff for lease of port infrastructure (if any)
LABOUR
VIETNAMESE EMPLOYEES
* Register Vietnamese employees.
* Obtain labour books
* Register social and health insurance
* Obtain social insurance book and health insurance card
* Register the internal labour regulations
* Sign and register collective labour agreement
* Formulate and register salary scale
* Prepare and file semi-annual and annual reports on status of using labour
FOREIGN EMPLOYEES
* Apply for work permits for foreign staff
* Register and complete entry/exit/residency formalities
* Prepare and file annual and semi-annual reports on the status of using foreign employees
* Import/purchase and arrange for inspection and registration of machinery and equipment subject to strict labour safety conditions
LAND
* Sign agreement on contribution of the land use right (if any)
* Sign the land lease agreement (if any) and obtain new LURC
Others
TAXATION REGISTRATION
* Purchase invoices issued by the MOF or register to use invoices printed by the Project Company
*Registration of personal income tax code for employees
FINANCE
* Register medium and long term foreign loan agreements and obtain SBV confirmation of the same (if any)
* Register onshore security documents with the relevant registrar
* Obtain approval for opening offshore account
* File quarterly report on foreign loan financing
BANKING AND ACCOUNTING
* Report on the status of opening and operation of the foreign currency offshore bank account
* File periodic report on the implementation of investment capital
* File annual audited financial reports of the company
TECHONOLOGY TRANSFER
* Registration of technology transfer agreement (if any)
* Registration of trademark transfer agreement (if any)
* Registration of trademark licensing agreement (if any)

(2) There are contracts to be concluded to implement the project. Below is a very preliminary list of the contracts that SPC may need to enter into with other parties related to the project. It is important to note that the List excludes governmental approvals and licences, and has been prepared on the assumption that (i) the Project will be implemented in the form of a joint venture company and (ii) is not a BOT or a PPP project. In addition, the List remains general and/or limited. It is not comprehensive and needs to be revisited once there is a greater clarity on the structure under which the project will be implemented, and on other facts which may only be revealed during the development of the project.

	Agreements	**Counterparties**
1.	Framework agreement with the Government (or authority(ies) duly authorized by the Government), setting out governmental undertakings and guarantees to the Project	Government (or authority(ies) duly authorized by the Government)
2.	Joint Venture Agreement (or shareholders agreement) for the establishment of the project company and for the development of the Project	Vietnamese partner (e.g. Vinacomin)
3.	Charter of the project company	Vietnamese partner (e.g. Vinacomin)
4.	Land lease agreement with respect to the land used for the development and operation of the Project	Local department of natural resource and environment (i.e. Tra Vinh DONRE)
5.	Loan agreements and other financing documents related to financing of the Projects	Lenders
6.	Port usage service agreements (i.e. the primary revenue-generating agreements for the Project) to provide port services to clients	Third parties using port services
7.	Agreements related to the design and construction of the terminal	EPC contractor and/or other contractors
8.	Operating and Maintenance agreements of the terminal, if any	Contractors
9.	Equipment and material supply contracts and other agreements relating to the procurement or maintenance of equipment or to the construction of the Project	Sellers and service providers
10.	Power purchase agreement (for electricity used during the construction, development and operation of the Project)	EVN (or subsidiaries of EVN)
11.	Water supply agreement (for water used during the construction, development and operation of the Project)	Water suppliers
12.	Telecommunication supply agreements (for the use of cable, internet, telephone and other telecommunication facilities)	Companies providing telecommunication services

13.	Fuel supply agreements and all other agreements relating to supply of the Vietnamese side infrastructure facilities	Fuel or facilities suppliers
14.	Coal supply agreements with coal suppliers (in case of import or purchase of coal)	Coal suppliers
15.	Insurance contracts related to the terminal's facilities	Insurers
16.	Other contracts related to the operating, ownership and development of the Project	Third party suppliers

13.2. PPP

(1) Applicable Legal Texts

Decision 71 of the Prime Minister (PM) provides regulations on pilot investment under PPP form (Decision 71).

(2) Financing of PPPs

PPP implies the collaboration between the government and the private sector in carrying out a project with social benefits, under an agreement that shares the responsibility and risks. According to Decision 71, the government's maximum stake in a PPP project is 30% except for special cases as approved by the PM. The private investor's equity capital must be 30% of its stake and there is no government carrying out a project with social benefits under an agreement in order to share the responsibility and risks. According to Decision 71, the government's maximum stake in a PPP project is 30% except in special cases as approved by the PM. The private investor's equity capital must be 30% of its stake and there are no government guarantees for loans to cover the remaining 70%.

(3) Sectors Available for PPP

PPP investments are allowed in roads, railways, traffic in urban areas, airports, seaports, river ports, fresh water supply systems, power plants, hospitals, environment-related projects and other projects as decided by the PM. A PPP project must be (i) an important and large one that is urgently required for the development of the Vietnamese economy, (ii) expected to be profitable, and (iii) one that will use the technology, managerial and operational experience, and financial capacity of the private sector.

(4) Start-up Costs

The government will fund the investment preparation costs such as the costs for selecting the list of appropriate projects, preparing feasibility reports, selecting the private participant, and other preparation costs. A private investor who is chosen to implement a project must refund the government the cost of the relevant feasibility report.

(5) Project Proposal

The Authorized State Body (ASB) will prepare the project proposal. Decision 71 includes a list of the requirements to be included in the project proposal such as details concerning the construction area of the project, analysis of technological and technical aspects, schedule for timing of construction, preliminary calculations of fees and charges produced, handover procedure, and an overview of the project. Interested private investors can also prepare project proposals in the same form as the ASB's project proposals, which will then be sent to the ASB and the Ministry of Planning and Investment (MPI) for review.

(6) Project Contract

The regulations set out the principal provisions to be contained in a project contract, which is the contract signed between an ASB and a private investor pursuant to which the state permits the private investor to make the investment, operate the project works and provide public services for a specified duration. PPP pilot regulations allow the use of step-in rights by lenders to the project, assignment rights and the right to amend the project contract in certain circumstances (subject to the approval of the investment certificate issuing body). The duration of the project contract will be agreed between the parties.

(7) Security for Performance of Project Contract

A bank guarantee or other security provided for in Vietnamese civil law must be given as security for the obligation to perform the project contract. The security must cover at least 2% of the total investment capital of the project and must be in force from the time of signature of the project contract until completion of the project works.

(8) Investment Certificate

The investor(s) will need to obtain an investment certificate for the implementation of the project. Decision 71 sets out the documents required in order to apply for an investment certificate and lists the items which will be included in the investment certificate when issued, including the name and address of the investor, the name, size and objectives of the project, and other specifications regarding the project.

(9) Site Clearance

The provincial people's committee will be responsible for site clearance.

(10) Management

The project enterprise manages and commercially operates the project facility and the ASB supervises and assesses compliance by the investor and project enterprise to ensure their obligations under the project contract.

(11) Charges

The charges and fees of the products and services provided by the project are specified in the project contract and can only be changed as provided in the project contract. The ASB must approve any change.

(12) Incentives

A project enterprise will be entitled to corporate income tax incentives as stipulated in the law. The goods imported to implement the project will benefit from incentives in the law on import and export duties. The project enterprise will be exempt from land use fees and land rent. Foreign contractors employed by the project enterprise will benefit from any tax exemption and reductions in tax in accordance with the law.

(13) Guarantee of Obligations

The ASB may, when necessary, make a submission to the PM for his approval for the ASB to provide a guarantee for the provision of raw materials, sale of products and other contractual obligations of the private investor and the project enterprise and a guarantee for the obligations of the SOEs that sell raw materials and/or purchase the services or products of the project enterprise.

(14) Tendering

The ASB will have to use the feasibility report to prepare tendering invitation documents. Tendering will be held in accordance with the Vietnamese law on tendering and consistent with international customs and practices.

13.3. BOT

(1) Applicable Legal Texts

The development of an investment project under BOT form is regulated mainly under the following legal documents:

1) Decree 108 of the government dated 27 November 2009 on investment in the forms of BOT, build-transfer-operate (BTO) and build-transfer (BT) contracts, as amended by Decree 24 dated 5 April 2011 (the BOT Decree);
2) Circular 03 of the Minister of Planning and Investment dated 27 January 2011 implementing certain articles of the BOT Decree (Circular 03).

(2) Encouraged Sectors

Under the BOT Decree, the government will in theory take special interest in projects concerning (i) land roads, bridges, tunnels and related utilities; (ii) railways and tramways; (iii) airports, seaports, river ports and ferry landings; (iv) water plants, drainage and waste or sewage treatment systems; (v) power plants and power transmission lines; and (vi) other infrastructure sectors as decided by the PM. It is also prepared to examine projects outside this list, if proposed by investors.

The MPI, together with other relevant ministries and provincial people's committees, will issue an annual list of projects calling for investment in the form of BOT contracts. This list, however, is not intended to be exhaustive. The PM has discretion to decide on other infrastructure sectors or projects.

(3) State Participation in BOT Project

State-owned capital used to carry out a BOT project cannot exceed 49% of the total investment capital of such project. The state-owned capital is defined as state budget capital, credit facilities guaranteed by the state, state-owned facilities for investment and development, capital for investment and development owned by the state-owned enterprises and other capital sources managed by the state.

(4) Selection of Investors

The investor can develop a project without going through a tendering process in some limited cases set out in Article 14 of the BOT Decree, which includes the case of direct appointment of the investor by the PM.

The investor selected to develop the project will normally enter into a memorandum of understanding (MOU) with the ASB to establish what is required and the schedule for the project.

(5) Investment Certificate

The investors will need to obtain an Investment Certificate issued by the MPI for the establishment of the project company and for the implementation of the project. The BOT Decree sets out the procedure and the documents required to obtain the Investment Certificate. After the Investment Certificate is issued, and the project company has been established, all other project agreements should be executed by the project company and the relevant counterparties.

(6) BOT Contracts

A government guarantees and undertakings agreement (GGU) request must be submitted and approved by the PM before the relevant parties begin to negotiate the project documents. In practice, the PM's approval to issue the GGU would come at a later stage.

Negotiation of the BOT contract will take place between the investor and the ASB. A BOT contract should include the main contents set out in Article 16 of the BOT Decree and Appendix II of Circular 03. The negotiation of other project documents occurs around the same time as the negotiation of the BOT contract.

There will be a BOT contract between the ASB and the investors. The BOT contract sets the framework for the development and operation of the project. The BOT contract sets out the rights and obligations of the project company and the ASB in respect of the project (and contains certain limited obligations of the investors). The BOT contract will be officially signed after the Investment Certificate is issued to the project company.

(7) Rights and Responsibilities of the Parties under the BOT Contract

The ASB has various obligations, including the responsibility for procuring the GGU (if any), for the Ministry of Justice's (MOJ's) legal opinion (if required by the lenders), for site clearance and preparation, and for ensuring that all relevant state bodies of Vietnam perform their obligations under the contracts and documents to which they are a party.

Subject to certain limitations, the investors are responsible for contributing their proportional share of the equity capital (in accordance with the joint venture agreement), and for using commercially reasonable efforts to assist the project company in negotiating financing documents.

The project company is responsible for designing, constructing, financing, operating and maintaining the project in accordance with agreed standards and according to the project contracts. The project company is also responsible for procuring the equipment and raw materials required, for maintaining insurance and for paying all taxes and duties.

(8) Incentives

A project company is entitled to the following incentives under the BOT Decree:

- Corporate income tax incentives provided for under the corporate income tax law. At law, companies invested in the development of especially important state infrastructure will be entitled to, in general, a corporate income tax of 10% for 15 years (with a possibility to extend it up to another 15 years). The project company will also be granted, in general, a tax holiday of four years starting with the first profit making year and a 50% exemption for a further nine years. An "especially important state infrastructure" project would include any road project or other infrastructure projects decided by the PM;
- Exemption from payment of import duties with respect to certain items imported for implementation of a BOT project, in accordance with regulations on import and export duties;
- Exemption from rent or land use fees for the whole duration of the project;
- Support from the government with respect to foreign exchange; and
- Support from the Government for the use of public services.

Accordingly, the project company shall be permitted to use land, roads and other support facilities to implement projects in accordance with the law and shall be given priority to be provided with services or to be granted the right to use public facilities to implement their project where public services are scarce or limited to only certain users.

(9) Rights of Lenders

Lenders to the project company are given the right to step in and take over the BOT project in the event the project company defaults on a loan agreement or the BOT contract. The BOT Decree requires such step-in rights to be set out in the financing documents and agreed by the ASB.

(10) Termination

Upon the expiry of the BOT contract, the investors and the project company must transfer their entire BOT project to the government free of charge. Certain conditions on quality, maintenance, warranty, environmental protections and other conditions necessary for operation of the project must be satisfied by the investors upon the transfer.

13.4. Comparison of PPP, BOT and JV

This information includes trade secrets.

This information includes trade secrets.

(1) Investment Certificate and Approvals

In order to develop the CTT Project, the investors will need to obtain an Investment Certificate. The Investment Certificate will record the name and address of the investors and of the project company, the name of the project, the purpose and scope of the project, the location for the implementation of the project and the proposed areas to be occupied, the total investment capital of the project, the incentives and government guarantees (if any).

The project company will be incorporated by virtue of the issuance of the Investment Certificate.

This Investment Certificate will only be issued if (i) the investors have received all required approvals for the project, and (ii) the CTT Project is consistent with the relevant master plans. Both of these require the investors to engage with numerous ministries and government departments. The Feasibility Study is an opportunity to engage with some of them, and the process of the review and approval of

the Feasibility Study is an opportunity to engage with others, all with a view to advancing the goal (to the extent it remains the goal) of being an investor in the CTT Project.

An investment in the construction of a national seaport project is listed by law as an investment in a conditional sector. Such an investment would require the approval of the PM. In addition, the procedure to issue the Investment Certificate will involve an evaluation by various ministries (such as the MPI, Ministry of Finance (MOF), MOT, Ministry of Industry and Trade (MOIT), Ministry of Natural Resources and Environment (MONRE), and Ministry of Construction (MOC)) before the Investment Certificate is issued.

As a result of the above, the Feasibility Study should anticipate the goals or concerns of each relevant ministry and include provisions that further such goals or address the concerns.

The Investment Certificate will only be issued if the CTT Project is consistent with the relevant master plans. This should be confirmed through the Feasibility Study inquiries with the government, and appropriate statements about those inquiries should then be included in the Feasibility Study itself.

(2) Seaport Master Plan

Investment in the construction of seaports must be in accordance with the master plan for development of ports as approved by the PM (the Seaport Master Plan). Accordingly, before conducting an investment in a port project, investors should ensure with Vinamarine that the project is consistent with the Seaport Master Plan.

The current Seaport Master Plan was issued by Decision 2190 of the PM. According to Decision 2190, the seaports system in Vietnam will be developed to include six seaport groups, each of which will be made up of integrated and specialized seaports.

The construction of a coal terminal at Duyen Hai - Tra Vinh is in line with the Seaport Master Plan set out in Decision 2190. This contemplates terminals used for importation of coal located in the eastern part of the Mekong Delta area (including one terminal at Duyen Hai – Tra Vinh) with a total capacity of 14-16 million t/year up to 2015, rising to 26-28 million t/year by 2020.

The detailed master plan for seaport development that is set out in Decision 1746 (Group 6) confirms the need for a coal terminal. Decision 1746 elaborates on Decision 2190. It foresees a terminal for importation of coal used for thermal power plants at Duyen Hai – Tra Vinh, with a capacity of 9 million t/year by 2015 and 11.5 million t/year by 2020. According to Decision 1746, by 2020 the terminal in Duyen Hai – Tra Vinh will include five wharfs with a length of 860 m that will cover 20 ha of land and be used for ships of 30,000 DWT.

The master plan has been reinforced by Notice 299 and Decision 2414, both of which underline the need to speed up the establishment of coal transshipment terminals in the Mekong Delta area for the purpose of fuelling power projects.

Once detailed specifications are prepared for the CTT Project, they should be evaluated against the location, size, capacity, timing and purpose of the coal transshipment terminals contemplated in the master plan. If there are any inconsistencies between the proposed specifications and the master plan, the relevant authorities should be asked to confirm whether or not an amendment/supplement to the Seaport Master Plan is required.

(3) Coal Master Plan

The coal master plan is contained in Decision 60 of the PM (the Coal Master Plan). The Coal Master Plan suggests that there will be terminals for the importation of coal in the Mekong Delta area. As such, although the Coal Master Plan does not contain detailed information on coal import terminals, the construction of the terminal at Duyen Hai – Tra Vinh appears to be in line with the general policy provided for under the Coal Master Plan.

(4) Maritime Transportation Master Plan

The master plan on maritime transportation is set out in Decision 1601 (the Maritime Transportation Master Plan). The Maritime Transportation Master Plan contains no specific provisions on the development of the port system but refers to the Seaport Master Plan. It contains some high level references to the development of logistics activities and other supporting services for maritime transportation. Accordingly, if the Feasibility Study were to conclude that the scope of the project company's operations were to cover logistics activities or other supporting services for maritime transportation, this should be consistent with the Maritime Transportation Master Plan.

(5) Port Investment - Foreign Ownership Limitations Considerations

In order for the Feasibility Study to set out the scope of the activities of the project company, certain foreign ownership limitations need to be considered. Depending on the level of foreign ownership contemplated by the Feasibility Study, these limitations might affect the exact nature of the proposal that is put forward in the study. This is because the maximum foreign ownership allowed for the project company as a whole will be limited to the maximum foreign ownership amount allowed for the business line of such project company that has the lowest foreign ownership permitted at law.

The table below sets out the maximum foreign ownership permitted for construction and operation of a transshipment terminal in Vietnam and restrictions that are currently applicable to related auxiliary activities. If the project company will be involved in any of these lines of business, the maximum foreign ownership may have to be factored into the Feasibility Study conclusions for the reasons set out in the preceding paragraph.

For the purpose of this table, although we realize that the main function of the port will be to act as a bulk cargo port, the study team has also covered container handling activities in case these are relevant in small part as an ancillary activity.

No.	Scope of Business	Foreign Ownership Restriction
1.	Transshipment terminal construction and operation	100%, though in practice most ports are joint ventures in which foreign investors have a lesser percentage.
2	Container handling services and other cargo handling services	50%. No commitment on removal of foreign ownership restriction.
3	Customs clearance services	100%
4	Freight station and depot services	100%
5	Storage and warehouse services	100%
6	Freight transport agency services	100%
7	Shipping agency service	49%. No commitment on removal of foreign ownership restriction.
8	Vessel towage service	49%. No commitment on removal of foreign ownership restriction.
9	Maintenance and repair of equipment, containers, trailers, chassis, facilities, quays and vessels	100%
10	Designing, financing and constructing terminal facilities and other related support facilities including inland container depot, office building, warehouses and logistic centers	100%
11	Purchasing and importing equipment and information systems to handle containers and other cargo for the business operation of the company	100%
12	Performing all other related services in regard to handling and transportation of containers and other cargo	From 49% to 51%. No restriction for international sea transportation.
13	Performing other logistics support activities	100%

(6) Capital

1) Amount and Structure of Capital

The Feasibility Study will also set out the anticipated capital requirements of the project company. Vietnamese law has few limits on the capital of a project as long as the project is licensed by the relevant authority through the issuance of an Investment Certificate.

Furthermore, in most cases, investors can specify the capital structure of the project company within the bounds of existing corporate law concepts. The desired capital structure will be reflected in the

Investment Certificate. Vietnamese law makes a distinction between total investment capital and charter capital (equity). The investment capital is the total amount needed for the investment. The investment capital includes both the loan capital and the charter capital. The charter capital is the equity contributed by shareholders and recorded in the charter. The project company cannot borrow more than the loan capital specified in its Investment Certificate except for working capital.

There is one slight exception to the above. If the CTT Project is implemented under the BOT investment form, it will be subject to certain debt-to-equity restrictions:

- If the CTT Project has total investment capital of up to VND 1,500 billion, the investors' equity must not be less than 15% of the total investment capital; and
- If the CTT Project has total investment capital of more than VND 1,500 billion, the investors' equity must not be less than 10% of the total investment capital.

2) Schedule for Capital Contributions

The schedule under which investors must contribute their charter capital depends on the corporate form in which the project company is established:

- The schedule is three years from the date of the Investment Certificate if the project company is a limited liability with two members or more.
- If the project company is a joint stock company, the founding investors will have to subscribe to at least 20% of the charter capital of the company and must pay for the subscribed shares within 90 days from the date of the Investment Certificate.

In many cases, the above schedules for the contribution of equity are not appropriate for large capital-intensive projects. If the financial part of the Feasibility Study indicates that a longer period for capital contribution is more effective, appropriate comments might be made in the Feasibility Study.

(7) Duration of Investment

The duration of the project will be set out in the Investment Certificate and is decided on a case-by-case basis. The Investment Law provides a maximum duration of 50 years for an investment project. In practice, most foreign-invested JV port projects have been licensed for this 50 year maximum.

By contrast, if the CTT Project is implemented as a BOT or PPP project, the licensing authority will start from the premise that the duration will be the minimum required to provide the investors with a "reasonable" return. Thus, in practice, the licensed duration of BOT gas-fired power projects has been 20 years, and that for coal-fired power projects has been 25 years. It would be difficult to predict the licensed duration of a BOT or PPP port project until the expected economics of the project are analyzed.

The Feasibility Study would normally contemplate a 50-year term, but the investors should be aware that this is not going to be automatically granted. There is an interplay between the expected financial performance of the CTT Project and the duration for which it is licensed. The better the anticipated performance, the shorter the duration that the licensing authorities are likely to perceive as necessary.

(8) Establishment of Project Company

The investors would need to carry out the procedures to obtain an Investment Certificate in order to invest in the CTT Project and to establish the project company (which happens automatically upon issuance of the Investment Certificate).

The application dossier for the issuance of the Investment Certificate (the Application) would include the following, among other things:

1) Request for the issuance of the Investment Certificate;
2) Feasibility Study (F/S);
3) Charter of the project company;
4) Joint venture agreement, if any;
5) Certified copy of the certificate of incorporation or the business registration certificate of each of the investors;
6) Certified copy of the charter or articles of association of each of the investors;
7) Statement of financial capacity of each of the investors (e.g. audited financial reports);
8) List of members of the project company;
9) Certified copy of letters of authorization; and
10) Certified copies of passport/ID card of the authorized representative(s) appointed by each investor to exercise its rights as a member/shareholder of the project company.

Other documents are often requested by the authorities in practice during the process of review and issuance of the Investment Certificate.

(9) Design/Construction Formalities

Before construction of the CTT commences, the company needs to carry out the following, among other things:

1) Prepare a plan for ensuring transportation safety and send it to Vinamarine for approval;
2) Obtain the approval on technical design of the CTT Project from the MOC;
3) Submit to Vinamarine a notification on the construction of the CTT, including copies of (i) decision on investment project with technical design; (ii) decision on approval of the technical design of the CTT Project, and (iii) plan for ensuring transportation safety.

After completion of the construction of the CTT, but before putting it into operation, the company has to obtain a decision from the MOT on making the terminal operational. As noted above, the investors

and the project company will need to work closely with the MOT as well as the MOIT in the CTT Project.

(10) Operation of the Terminal

There are various regulatory aspects to the operation of the CTT.

1) Ship entry/exit notification and registration

Information about the entry of ships to the CTT must be given and then confirmed to the Port Authority before their arrival to the CTT.

Vessels must conduct the procedure to register their entry to the CTT with the Port Authority within two to four hours after arriving at the CTT.

A similar procedure for notification and registration is required when vessels leave the CTT.

Temporary entry of vessels to the CTT is also subject to notification, confirmation and registration procedure.

2) Management of ship operation

The project company will have responsibilities to arrange and manage the operation of vessels in the CTT and to prepare wharves and personnel to ensure the security and conditions of the CTT.

3) Security, fire prevention, and environmental protection

The project company will have to organize and manage the security staff at the CTT as well as to comply with regulations on fire prevention and environmental protection within the CTT.

4) Port services and related maritime services

The project company is entitled to provide port service and related maritime service.

(11) Port Service Tariffs

The project company can enter into service/lease agreement with third parties to provide services and lease infrastructure of the CTT in compliance with business lines that are recorded in the Investment Certificate.

The tariff for lease of port infrastructure is subject to the approval of the MOF. It can also be adjusted in some circumstance provided for by the law. These items will be of some importance in the determination of the feasibility of the CTT Project and details of assumptions should be set out in the Feasibility Study.

(12) Maritime Charges and Fees

Vessels entering and exiting the CTT are subject to maritime fees and charges in accordance with tariffs provided by the MOF.

13.6. Land Acquisition

(1) Applicable Legal Texts

The acquisition of land is regulated primarily under the following legal documents:

- Law on Land of the National Assembly dated 26 November 2003, as amended (the Land Law);
- New Law on Land No. 45 of the National Assembly dated 29 November 2013, which will be effective as from 1 July 2014 (the New Law on Land);
- Law on Real Estate of the National Assembly dated 12 June 2006 (the Law on Real Estate).
- Decree 181 of the government dated 29 October 2004, as amended, providing implementation of the Land Law (Decree 181);
- Decree 69 of the government dated 13 August 2009 on land use planning, land price, land recovery, compensation, support and resettlement (Decree 69);
- Decree 88 of the government dated 13 August 2009 on issuance of land use right certificates, land recovery, implementation of land use rights, procedures to compensate, support and resettle upon recovery of land by the state and settlement of land claims (Decree 88);
- Decree 142 of the government dated 14 November 2005 on collection of rent for lease of land and water surface, as amended (Decree 142);
- Decree 12 of the government dated 12 February 2009 on management of investment projects on construction of works, as amended (Decree 12);
- Decree 153 of the government dated 15 October 2007 on implementing the Law on Real Estate Business (Decree 153);
- Circular 14 of the MONRE dated 1 October 2009 detailing compensation, support, resettlement, procedures to recover, allocate and lease land (Circular 14); Joint Circular 01 of the MONRE, Ministry of Internal Affairs and MOF dated 8 January 2010 on functions, obligations, rights, organizational structure and financial regime of the land fund development organization (Joint Circular 01); Circular 13 of the MOC dated 21 May 2008 on implementing Decree 153 (Circular 13); and
- Circular 01 of the MONRE dated 13 April 2005 on implementing Decree 181 (Circular 01).

(2) Overall Process for Acquisition of Land

Land and water surface needed by the project company can be leased directly from the government or contributed by the Vietnamese partner. In the latter case, the Vietnamese party has to enter into a lease with the state, although the relevant land use right certificate will be issued in the name of the project company.

The process for acquiring land for the CTT Project can be summarized as follows:

1) Compliance with the master plan - The investors would work with the relevant central authorities (MOIT and possibly MOT) and local people's committee to determine the land required (the Site) and to make sure that the Site has been included both in the Seaport Master Plan and in the master plan for use of land in the locality.
2) Site clearance and compensation; recovery of land by the state – As there are a number of land users currently on the contemplated Site, the Site would need to be cleared and compensation would need to be paid in order for the state to (1) recover the Site from the current land users and (2) remove the current land users from the Site.

13.7. Corporate Income Tax

(1) Applicable Legal Texts

The Corporate Income Tax (CIT) regime in Vietnam is regulated primarily by the following legal documents:

- Law on CIT of the National Assembly dated 3 June 2008, as amended (the CIT Law); and
- Decree 218 of the government dated 26 December 2013 implementing the CIT Law (Decree 218).

(1) Outline of CIT Regime

CIT is levied on the taxable income of all companies in Vietnam.

The current standard CIT rate is 22%. From 2016, the standard CIT rate will be 20%.

The taxable income is equal to turnover less deductible expenses of activities of production and business, plus other assessable income. Deductible expenses are strictly regulated by the tax authority and must be supported by valid invoices, vouchers and relevant documents. They consist of production costs, employment expenditure, insurance, financing and tax-related costs, management fees, and other expenses in relation to the sale and distribution of goods and services. Limitations are applied to certain deductible expenses. For example, expenses allowed for advertising, sales and marketing promotions are limited to a percentage of total deductible expenses. Deductible depreciation costs also are capped.

During operations, any losses incurred by a company in any tax year may be carried over to the following years and such losses are deductible from taxable income. Losses may be carried forward for a maximum period of five consecutive years as from the year following the year in which the loss arose. Carrying back of losses is not permitted.

(2) Incentives

Tax incentives are granted to new investment projects based on the following:

1) Whether they are in a specified encouraged sectors - infrastructure development projects are generally an encouraged sector;
2) Whether they are in a specified encouraged location – Duyen Hai may qualify; and
3) The investment in and revenues from the project.

Business expansion projects which meet certain conditions are also entitled to CIT incentives.

The two preferential rates of 10% and 20% (17% from 2016) are normally available for 15 years and 10 years, respectively, starting from the commencement of operating activities.

Taxpayers may be eligible for tax holidays and reductions, such as some years of tax exemption and a 50% reduction on the applicable rate for a specified number of additional years, starting from the time of first making a profit or from the commencement of operating activities, depending on the facts. When the preferential rate expires, the CIT rate reverts to the standard rate.

(3) Profit Remittance

Foreign investors are permitted to remit their profits annually at the end of the financial year or upon termination of the investment in Vietnam. Foreign investors are not permitted to remit profits in a year if the investee company has accumulated losses.

The foreign investor or the investee company is required to notify the tax authorities of the plan to remit profits at least seven working days prior to the scheduled remittance.

13.8. Coal

(1) Coal Importation

There is no specific law and regulation relating to coal importation. There is no license necessary to import coal.

(2) Coal Price

Coal price: Under Article 15 of Decree 177 of the government dated 14 November 2013 on detailing and guiding the implementation of the Law on Price, the price of coal shall be subject to price declaration. It means the price of coal shall be determined by organization producing and/or trading coal (i.e. the project company). However, such organization must send notice of price declaration to competent agencies (e.g. the MOF or the Department of Finance) before determining or adjusting price at least five days in advance. The law does not make a distinction between imported coal and other types of coal. Therefore, imported coal may be subject to price declaration.

(3) Coal Relating Tax

In importing and handling coal in Vietnam, there are taxes imposed, import duty, value-added tax (VAT) and environmental protection tax. Import duty is 0% to 3%, according to Circular 134 of the MOF dated 15 November 2013. VAT is 10%, according to Circular 131 of the MOF dated 26 December 2008.

Environmental protection tax is from VND 10,000 to VND 20,000 per t for each kind of coal, according to Ordinance No. 1269/2011/UBTVQH12 of the Standing Committee of the National Assembly dated 14 July 2011.

(4) Steering Committee for Imported Coal

Under the MOIT's Decision 2745 dated 24 May 2010, the steering committee has been established. It appears that the committee is not involved in determining the price for imported coal. Until the MOIT issues further implementing regulations for Decision 2745, it is difficult to say how the rights and responsibilities of the committee will be detailed and how this would affect the CTT Project.

Chapter 14. Risk Analysis & Security Package

14.1. Risk Analysis

Implementing a large infrastructure project such as the coal transshipment terminal at Duyen Hai, Tra Vinh (the Project) will involve various kinds of project risk. The company implementing the Project (the Project Company) can categorize these risks loosely (as they sometimes overlap from one category to another) as follows:

- country/political risks;
- natural risks;
- legal risks; and
- commercial risks.

Each of these risks will have to be properly allocated. The focus of this note is to raise the broad risks that should be considered in the context of the Feasibility Study. If appropriate, they can be mentioned in the Feasibility Study as risks that will need to be allocated properly in order for the Project to be viable and bankable.

This note does not purport to be exhaustive or to comment on how to handle the risks that are discussed in it. This will be more appropriate after further information is available not only about the Project but also about the structure that will be adopted with respect to its implementation.

14.1.1. Country/Political Risks

(1) Political Events

1) There are various types of political events that could affect the proposed Project. Political risks include war, widespread strikes, repudiation by the state of important contracts involved in the Project, failure to perform by Vietnamese bodies whose performance is important for the Project, expropriation or nationalization, and adverse changes in law.

2) While the expectation is that the disagreement between Vietnam and China with respect to the recent installation of a Chinese oil rig in the East Sea is temporary, it highlights the unpredictable nature of the seaways leading to the port contemplated by the Project. It is therefore reasonable to expect a certain focus on political risk at the present time.

(2) Development Risk

1) The investors will need an investment certificate for the Project and for their investment in the Project Company. It can often take a long time to develop a Project and to obtain an investment certificate for an investment project in Vietnam. This is because large numbers of government bodies are involved in the licensing process and because the administrative system is not very transparent.

2) A number of foreign investors have, in the past, walked away from large-scale projects because of the difficulty in implementing them over a reasonable timeframe under appropriate terms and conditions. However, the country is changing everytime and lessons are being learned, so the existence of past problems in other projects does not necessarily mean that the Project will experience the same issues.

(3) Government Authorizations

1) The Project Company may be unable to develop the Project or to enter into operation on time (or at all) due to difficulties in obtaining required licenses, permits, approvals, and authorizations (***Government Authorizations***).

2) Numerous Government Authorizations will be required by the Project Company to do business. The fact that the investors receive an investment certificate does not mean that the Project can be built or operated until all Government Authorizations relevant to construction or operation have been obtained. This may result in delays and additional costs.

3) The impact of the requirements for Government Authorizations may be limited if the regulations are followed and if a state-owned company is the majority partner in the Project Company.

(4) Change in Law

The Project will be the first of its kind in Vietnam. Where there is a lack of law, various issues will be within the discretion of the authorities, and the exercise of that discretion could affect the Project. The Project could also be adversely impacted by changes in law or laws that are passed after it is put into construction or operation. As a consequence, the cost of construction or operation can be increased or the Project's direct or indirect rights might be adversely affected.

(5) State Ownership

The major shareholder in the Project Company is expected to be a state-owned company. Consequently, state assets will be tied up in the Project Company. There is a risk that the state could cause disruptive investigations in the management of the Project Company in the event that the state perceives a loss of its assets.

(6) Restriction on Foreign Ownership

Investment by foreign investors in Vietnamese companies may be subject to foreign ownership restrictions. Under the commitments of Vietnam to the WTO (the *WTO Commitment*) and current laws and regulations, the foreign ownership of a company is limited to 49% or 51% with respect to some kinds of port-related activities, such as cargo handling services, shipping agency services, or transport services. Foreign investors cannot own a greater percentage of a company than the percentage applicable to the business line that is subject to the lowest foreign ownership limitation.

(7) Ancillary Infrastructure

The port will not exist in a vacuum. It is essential that other facilities required for the efficient functioning of the port are built by the responsible government agency as and when agreed in the detailed documentation. This includes any infrastructure connecting the port with the outside area, such as dredged access channels, roads (and possibly railways), electricity, gas, and water.

(8) Policy Change

As discussed in paragraph 1), the government is adopting a new power master plan to replace the current Power Master Plan VII. It is unclear if the new power master plan will affect the power projects in the region. In addition, changes of policy applicable to alternative fuel or renewable energy may affect the viability of the Project.

14.2. Natural Risks

(1) Natural Force Majeure

Natural force majeure includes (as example) epidemic, plague and quarantine; explosion, accident, contamination, radiation and fire; acts of nature; and accidents of navigation, air crashes, shipwrecks, train wrecks or other failures or delays of transportation that are not reasonably foreseeable.

(2) Land

In Vietnam, the process of land acquisition takes a long time, and as a result, projects often incur delays in their completion. There is nearly always a land acquisition risk (particularly delay risk and sometimes availability and cost risks) in a project such as this. The extent of the risk will depend on numerous factors, such as how much land is needed; whether such land is already available for development or still needs to be cleared (and if the latter, how many families are currently on the land and what clearance and compensation issues might exist); whether water surface rights are needed; and whether the land will be made available to the Project Company in full before the investors have to invest any capital.

(3) Environment

Construction of the port may have an adverse influence on the natural and social environment. The Project will have to comply with the environmental and social criteria of any lenders to the Project. The local authorities and majority partner will have to be aware of the issues involved.

14.3. Legal Risks

(1) Legal Framework

1) As this project will be the first of its kind, the legal framework will be less than fully developed on certain issues (e.g., competition, rights and obligations of coal importers). The lack of a secure legal infrastructure would have to be compensated by a contractual approach under which assurances are received from the appropriate governmental body.

2) Vietnamese law contains many gaps, contradictions, and internal inconsistencies. Vietnamese parties to a contract are not used to detailed international standard contracts. There is therefore a heightened risk of disputes.

3) The MPI is preparing a draft decree which will replace both Decree 71 on PPP pilot regulations and Decree 108 on BOT investment, as amended (the ***Draft Decree***). This would have unpredictable consequences for the development of the Project. It is not possible to predict with any accuracy when the Draft Decree will be issued.

(2) Contracts

1) If any of the Project documents have to be governed by Vietnamese law, they will need to be carefully drafted to ensure that, to the extent possible, they deal with the gaps and ambiguities in the law. Vietnamese law is neither well developed, consistent or clear, nor does it have a system of binding case law or other interpretative aids of binding precedential value, and Vietnamese courts have broad powers to imply fairness terms into contractual obligations. Accordingly, Vietnamese law is subject to broad interpretation and different lawyers and courts can have contrasting views of the legality, validity or enforceability of a particular agreement. The ultimate arbiter of legality and enforceability, as a matter of practice, is often the government ministry, department or agency responsible for administering the relevant law or regulation.

2) As certain foreign laws, such as English law, are more thorough and predictable, it would be better if foreign law rather than Vietnamese law governed all Project documents. This may indeed be a requirement of project finance banks. Unfortunately, the extent to which foreign law can be used with respect to the Project documents is not clear. The qualifications as to the ability of contracting parties to select a foreign governing law under Vietnamese law are broad and uncertain. In practice, Vietnamese parties to a project, particularly state-owned entities, tend to resist entering into contracts governed by foreign law.

(3) Enforcement

1) It would be possible for Vietnamese counterparties to fail to perform their contractual obligations in accordance with the terms of the contract agreed with the Project Company. In the unfortunate event that this occurred, the Project Company would in the end have to seek recourse. But even if the Project Company sues such Vietnamese counterparty and wins the lawsuit, it is difficult to enforce the verdict.

2) Although recent changes in Vietnamese law have improved the legal regime governing contracts, there remain a number of reasons why the Project contracts may not be as enforceable in Vietnam as in more developed jurisdictions.

i) The outcome of any litigation in Vietnam against a Vietnamese counterparty is uncertain, especially if the case is complex or if the counterparty is state-owned. Vietnamese courts are reported to sometimes be less than neutral between foreign and Vietnamese state interests.

ii) If the litigation occurs outside Vietnam, there remains the problem of enforcing a judgement in Vietnam. A foreign court judgment would only be considered by a Vietnamese court for recognition and enforcement where (i) the court judgment has been made in a country with which Vietnam has signed or acceded to an international treaty on recognition and enforcement of judgments, or in a country which grants reciprocal treatment to Vietnam on such matters or (ii) the recognition and enforcement of such court judgment is specifically permitted by Vietnamese law. Few countries have signed or joined an international treaty with Vietnam on recognition and enforcement of judgments or granted reciprocal treatment to Vietnam in respect of the recognition and enforcement of civil judgments.

iii) The remaining possibility, if there is a dispute between the parties, is to engage in arbitration outside Vietnam. While Vietnam is a member of the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards, there are various bases on which an application for recognition and enforcement of a foreign arbitral award may be rejected by a Vietnamese court. As one example, the court can decide that the dispute should not have been referred to arbitration or that the recognition and enforcement of the award is contrary to "basic principles of Vietnamese law". Perhaps as a result of such broad discretion, there have been few cases of enforcement in Vietnam of a foreign arbitral award against a Vietnamese state company.

(4) Land Security

Under Vietnamese law, real property belonging to a company, such as the Project Company, may be mortgaged by way of security to a lender. However, the Project Company is only permitted to mortgage its land use rights to credit institutions that are permitted to operate in Vietnam. The Land Law does not recognize the grant of security over land use rights to foreign lenders. As foreign lenders are the only ones currently able to engage in any sizeable project financing in Vietnam, this legal limitation is a bankability issue.

(5) Sovereign Immunity

1) Under international law, a state and its property are immune from suit and execution of judgment. There are currently two doctrines concerning sovereign immunity. Western countries adopt the restrictive doctrine of immunity whereby a state and its property are explicitly immune from suit and execution of judgment only to the extent of public acts but not commercial acts. Other

countries adopt the doctrine of absolute sovereign immunity, i.e., a state and its property are explicitly immune from suit and execution of judgment.

2) There is no Vietnamese law addressing the issue of sovereign or other immunity of state-owned companies. Vietnamese law does not make a clear distinction between public/government acts and private/commercial acts. It is therefore possible that courts may imply or create immunities that have not been legislated. This creates risks if the state or state-owned entities have contracts with the investor or the Project Company.

(6) Limited Duration

1) Each investment project in Vietnam has a limited duration. The maximum duration (absent very special circumstances) is 50 years. Prior to the termination of the Project, the investors could exit the Project Company in the following ways:

- Sale to other shareholders;
- Sale to a third party;
- Redemption of shares (limited and difficult).

2) There are various risks posed by the above, which will need to be worked through in the Project documentation, such as the ownership of assets upon expiry of the duration of the Project Company, pre-emptive rights mechanisms, and redemptions.

14.4. Commercial Risks

(1) Tariff

1) The port revenues will account for a significant portion of the Project's revenue. Tariffs for port services (such as fees for ships arriving and exiting the port, maritime insurance fees, fees for navigators, fees for boarding ships, fees for use of the wharves for boarding and/or for handling goods, etc.) are provided by the Ministry of Finance. In order for the Project to be financeable, the Project Company would need a reasonable and clear process for setting and amending tariffs.

2) The tariff will be impacted by the effects of domestic inflation or foreign inflation and possibly by fluctuations in foreign exchange rates. All of these will need to be considered in deciding on the appropriate tariff mechanism.

(2) Demand Risk

1) The viability of the Project depends on demand for its services and for the coal imported through it. This demand depends in part on whether the economic growth of Vietnam will develop as forecasted or not. The Power Master Plan for the country is currently in the process of being revised by the Ministry of Industry and Trade. The premise for the revision is that power demand

is growing less swiftly than was expected at the time the current plan was drafted. The number and timing of construction of power plants in the country is therefore expected to be reduced or slowed down. The effects of such revisions should be reviewed to ensure that they do not negatively affect the Project.

2) Even if economic growth develops as currently forecasted, demand can deviate if power supply policy is amended to encourage a swift expansion of the use of liquid natural gas, possibly for environmental reasons or because the costs of such gas decline more swiftly than expected due to increased supply from the United States.

3) Demand would also be affected if competing coal ports were to be built or if power plants were to build their own private ports of an economic size that enables them to cut out the support provided by the Project.

(3) Chain Risk

The Project is one part of a chain that depends on coal-fired power plants, which are the main end-users of coal, being built and ordering coal that will be imported through the port. If there is a delay in any part of the chain over which the Project Company has no control, such delay could nevertheless affect the economics of the Project.

(4) Completion Risks

As the coal supply chain has little substance at the moment in Vietnam, there are numerous completion risks that could affect the Project. Examples of these risks would include:

1) The risk that some or all of the contemplated power plants cannot procure coal offshore at the price that is needed in order either for such plants to be viable or for a coal market to develop generally.

2) There is a risk that the contemplated power plants will not be built or will not be built on time. For example, if the coal-fired power projects at Long Phu are delayed, for whatever reason, the income that the Project will expect through handling coal for such power projects will be delayed. In the extreme, power projects that are currently expected to be built may never be built. Many large-scale projects suffer some sort of delay, whether for political reasons, financial reasons, land availability reasons or poor planning. The details of the power plant timing have not been investigated and it is not suggested that they will in fact suffer from delays. However, the possibility cannot be excluded.

(5) Downstream Transportation

There would also be risks relating to the downstream supply of coal by the Project Company to the power plants. Once coal arrives at the port, it would have to be trucked or barged to the power plants. There would be risks relating to the availability of the appropriate infrastructure, roads and trucks (or

barges, as the case may be) at or before the commercial operation date of the relevant plants. There would also be risks that such infrastructure is not maintained in a proper manner.

(6) Dredging Channel

If the shipping channel and/or the turning basin are not dredged to the acceptable level, ships would not be able to access the port.

(7) Currency Risk

An offshore coal purchase agreement between a foreign supplier and a Vietnamese purchaser would be denominated in dollars.

By contrast, prices between two domestic Vietnamese companies, such as the Project Company and any downstream power plant company, have to be quoted and paid in Vietnamese dong, without reference to foreign currency.

If the Project Company imported coal and resold it to power plant companies, there would be a mismatch between the currency of purchase and the currency of sale.

The devaluation of local currencies without any impact on the dollar price of coal has given rise to large losses for similarly placed companies in other countries. One can therefore expect the Project Company to try to pass on the risk of such currency mismatch.

The Project will ordinarily look for project finance, and project financing is currently only available in hard currency (ordinarily US dollars). It will therefore be essential to ensure that port fees and other income of the Project can be paid to the Project Company in foreign currency so as to provide certainty of repayment of the project loans to lenders. The alternative is to obtain a Vietnamese government guarantee relating to conversion of Vietnamese dong into foreign currency at an agreed exchange rate.

(8) Credit Risk

The power plants are the key end users that will be responsible for payment, either directly or indirectly, so their credit would be important to the Project Company and, indirectly, to lenders.

(9) Competition

If the project sponsors are taking market risk, then the presence of extra competition could affect the market and hence the extent of the risk that they are taking. The Project Company may want some commitment from the government that it will not allow competing ports except on agreed terms.

(10) Utilities Supply

There would be a risk relating to the availability of utilities (such as water, electricity, communication cables) which are needed for the construction, start-up, and operation of the Project. The Project Company will need assurances on the provisions of these utilities, in terms of both quality and technical specifications.

14.5. Risk Mitigation

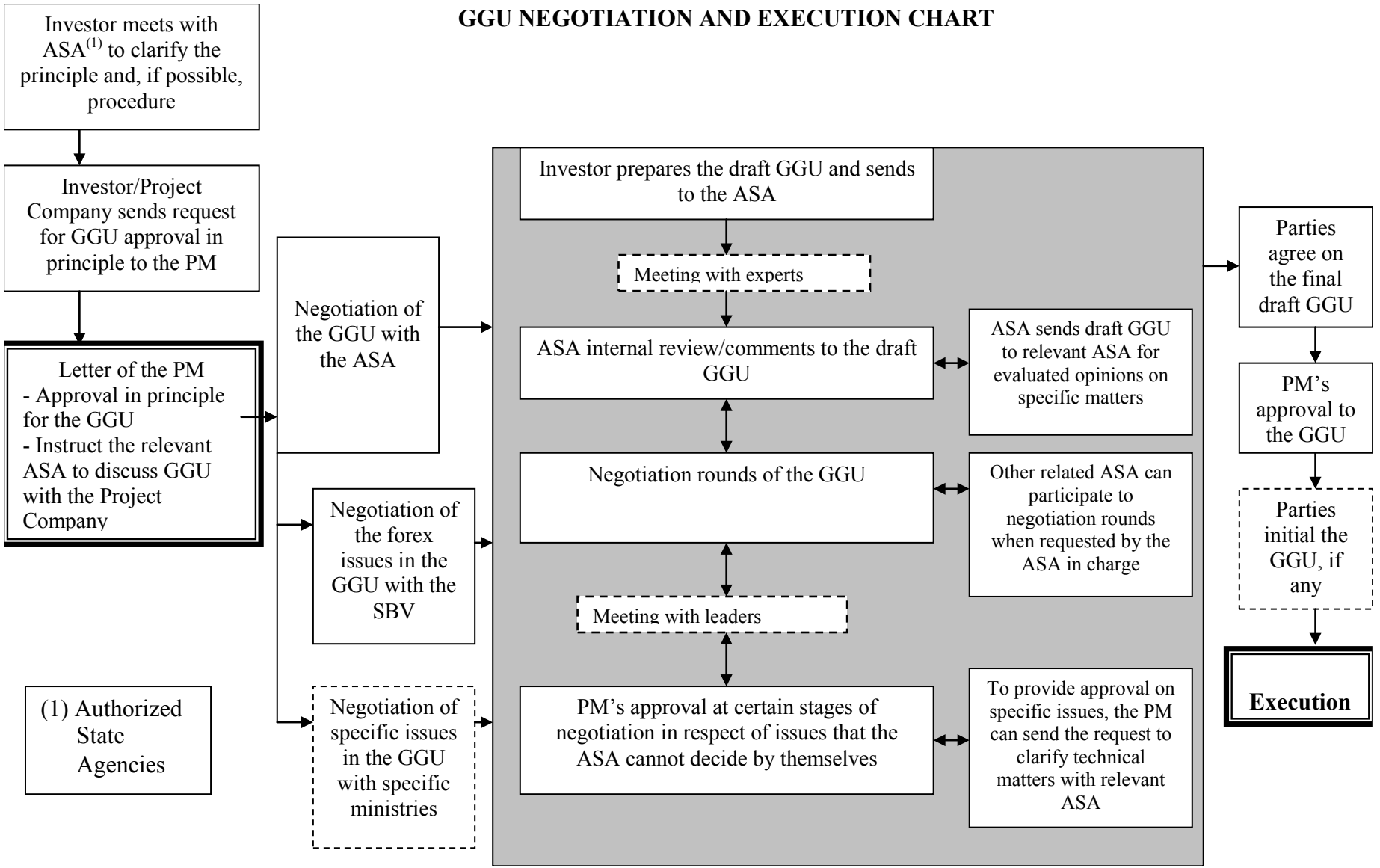
(1) GGU

GGU is indispensable and essential to start the study of the Project and to stably operate it during the Project period. Below is a general chart of procedure flow to obtain GGU.

(2) Insurance

NEXI’ insurance for foreign investment is one of risk mitigation methods to cover losses occurring due to force majeure (war, terrorism, natural disaster), governmental expropriation, and impossibility to remit dividend and profit from Vietnam by regulation.

GGU NEGOTIATION AND EXECUTION CHART



14.6. Risk Mitigation by Risk Ype

This information includes trade secrets.

Chapter 15. PPP Project Plan

15.1. Investment Structure for the Coal Transshipment Terminal (CTT) Project

(1) Investment Structure for CTT Project

As mentioned in Chapter 13, the pilot public-private partnership (PPP) regulations are only effective for five years from the date of effectiveness, which was 15 January 2011, and these regulations will shortly be replaced by the PPP/BOT New Decree. The build-operate-transfer (BOT) regulations will also be repealed by the PPP/BOT New Decree. This is because there will be so many new issues, the details of which will need to be resolved by the numerous government bodies responsible for them. It will thus be difficult to implement new PPPs for a substantial period of time. In Vietnam, the difficulties are exacerbated by the lack of PPP institutions and highly-trained personnel and the conflicting interests that may exist between ministries and other government bodies. The result of the above is that neither the BOT nor the PPP investment form can currently be relied upon. The alternative is to develop the CTT Project as a joint venture (JV) under the Investment Law.

There is a refinery project in Vietnam which has been implemented under the investment law. Other than the refinery project, a government guarantees and undertakings agreement (GGU) has been issued for other projects in the oil and gas sectors, although these projects have not been implemented under BOT scheme. Different port projects which have been developed under the investment law have been financed and granted with certain elements of support from the government. Some specific arrangements have been granted for some projects in different industrial sectors, depending on the importance of the projects to the development of the socio-economic development plan of the province, the ability to provide employment to the local workforce, the available state budget, the willingness of the authority, and the negotiating power/relations of the investors. These supports can include support for site clearance and compensation, support in term of tax and undertaking for the government authorizations and for provisions of the infrastructure or utilities (water, power and communication).

(2) Obtaining Government Support for a JV

One of the main differences between a project developed as a BOT/PPP rather than as a JV is that BOT/PPPs will have government support, or at least protection against certain risks that are outside of the Project Company's control. As such, if they are properly structured, these projects can benefit from project financing. In order to put a JV project in the same position, the JV project would request government support. Support for JV can be provided in different ways, through a GGU or through project-specific arrangements that are negotiated between the Project Company and the relevant ministry(ies) or government department(s).

(3) Coverage of Government Support

Although the list of concerns to be covered in the government support depends on the exact nature of the project, government support could be requested for the items in the following non-exhaustive list, among others:

1) Allocation of governmental risks and buy out of the investors' interest in the Project Company if (i) there is a default by the Vietnamese JV partner in the performance of its obligations (including its obligations to secure the performance of actions by the relevant government authorities or state-owned companies); (ii) certain events of political force majeure occur; or (iii) certain agreed events of natural force majeure occur.

2) Ancillary infrastructure – such as responsibility for dredging.

3) Permits, approvals and licenses: The relevant ministry(ies) or government department(s) should assist the Project Company in obtaining government permits, approvals and licenses. The Project Company should be protected against any inability to procure all government permits, approvals and licenses required under the financing documents.

4) Change in law: There should be a mechanism that goes beyond the inadequate provisions in the law to protect the Project Company against a change in law. If a change in law results in an adverse impact to the Project Company/investors, then the Project Company should be entitled to the reimbursement of additional costs or expenses or decreased revenues, either in the form of direct compensation or some other agreed adjustment.

5) Cost overrun: If there is an increase in the Terminal Project cost resulting from (i) a request for change, in the appraised design or otherwise, by any relevant authority, (ii) force majeure or governmental force majeure, or (iii) costs relating to land, the Project Company should be compensated, either through a direct payment and/or some other agreed adjustment.

6) Delay of Terminal Project: In the event of delay of the Terminal Project caused by any force majeure or by default of the Vietnamese side, the commercial operations date (if the Project Company commits to one) should be extended by the duration of the delay. In addition, the relevant ministry or government department should pay the Project Company for such delay an amount sufficient to compensate the Project Company for the cost incurred arising from such event, including the cost incurred by the Project Company under the financing documents.

7) Nationalization or expropriation: If nationalization and expropriation of the Terminal Project occurs, the Project Company should be entitled to terminate the Terminal Project by serving a notice on the relevant ministry or government department and to claim the agreed termination payments.

8) Foreign exchange

It is very important for investor to exchange Vietnamese dong to foreign currency in order to make repayment for finance and payment for goods and equipment. Investor should obtain guarantees of the convertibility, availability and remittability of foreign currency by the Vietnamese government. It is necessary for the investor to have discussion to obtain protection from Vietnamese government so that the Special Purpose Company (SPC) would not suffer from foreign exchange loss.

9) Utilization of CTT

The capacity of CTT is designed based on the plan of power stations which will use the CTT by the Vietnamese government. SPC needs to obtain the Vietnamese government's guarantee that the power stations will use the CTT and pay the necessary fees.

10) Payment

SPC should obtain the Vietnamese government's guarantee that the power stations will pay the fee for using the CTT and that the Vietnamese government will pay the SPC in case the power stations fail to make payment.

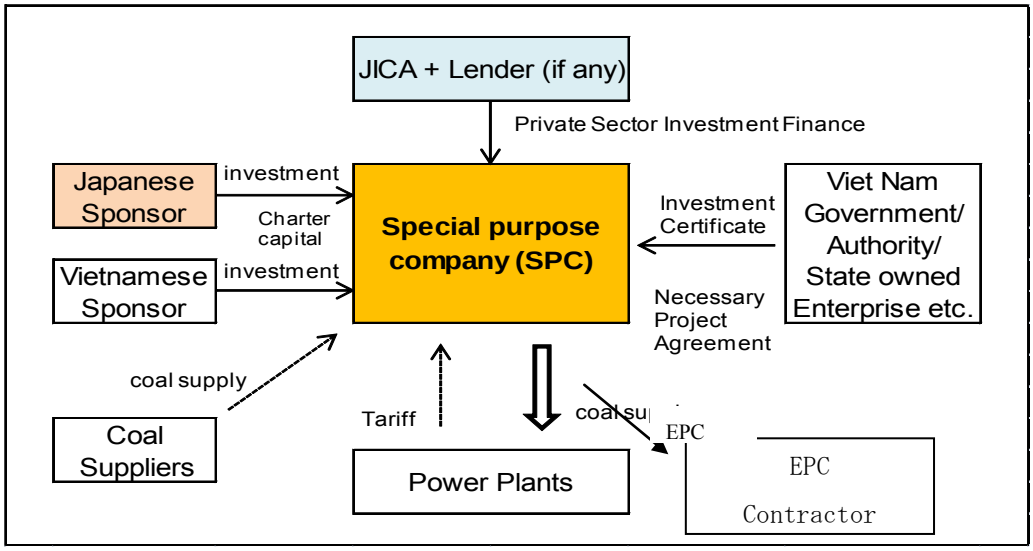
15.2. Project Execution Plan

(1) Project Execution Structure

This section proposes the project execution structure during the construction and operation phase.

SPC will raise the funds for the construction cost of the upper infrastructure of the CTT and will construct the upper infrastructure of the CTT. Then, SPC will be responsible for its management and operation after completion of the construction. Utilizing public funds, such as ODA, the Government of Vietnam will raise the funds for the construction cost of the lower infrastructure of the CTT and then construct it. After completion of the construction, the Government of Vietnam will maintain, manage, and operate it. The project execution structure is shown in Figure 15.2.1 below. SPC will make contracts stipulating the construction of the upper infrastructure of the CTT and its operation and management with the Government of Vietnam and will order the construction, engineering, procurement of the CTT to the EPC contractor.

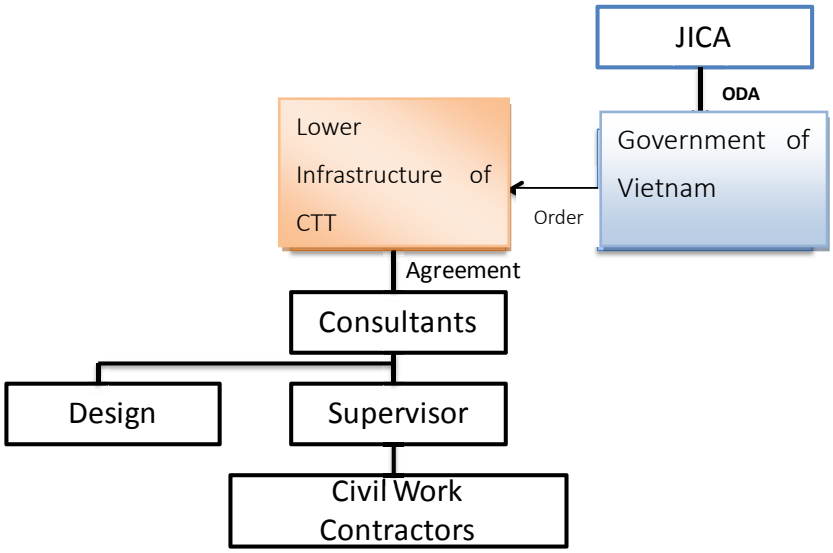
It is recommended that the SPC, which raises funds, constructs, manages, and operates the upper infrastructure of the CTT, should have an experience of operating and managing the CTT in Vietnam or some other countries and of procuring and supplying coal domestically and internationally and is a coal user, such as IPP operators.



Source: JICA Study Team

Figure 15.2.1 Project Execution Structure for the Upper Infrastructure of the CTT

The project execution structure of the lower infrastructure of the CTT is shown in Figure 15.2.2. The Government of Vietnam will order the operator of the lower infrastructure of the CTT. The operator of the lower infrastructure of the CTT will hire a consultant who is responsible for the design and construction management of the lower infrastructure of the CTT. The operator will enter into civil construction contract with each civil contractor. The consultant will support the procurement activities related to invitation of tenders, evaluation, and selection of the successful bidders. After completion of the lower infrastructure of the CTT, the operator will manage and operate it.



Source: JICA Study Team

Figure 15.2.2 Project Execution Structure for the Lower Infrastructure of the CTT

(2) Possibility of Enlarging the Scope of Business

At this moment, coal importer has not been clearly decided yet. But as there is high possibility that Vinacomin should be appointed as coal importer, it is assumed that the scope of CTT business in this survey will be receiving, stocking and making shipment of coal considering that the customers of the CTT are CFPPs or coal importers. In case that the SPC operating the CTT becomes a coal importer and enlarge its business scope to coal procurement, coal stock management, and coal sales, it can possibly contribute to mitigating and minimizing the commercial risks of the SPC. Main customers of the CTT, i.e., CFPPs, will also possibly enjoy reducing coal procurement cost and coal stock cost and improving their bargaining power in negotiating with coal shippers and shipping companies. In this case, it is essential that SPC has not only the know-how of the CTT operation, but also cooperation with business partners having ability to procure coal from shippers which are able to stably and competitively supply coal.

15.3. Operation and Effectiveness Index

Table 15.3.1 shows the operation and effectiveness index in terms of technologies, economics and finances, investment regime, and environmental and social considerations.

Table 15.3.1 Operation and Effectiveness Index

Item	Before Project Execution	Project Execution Phase
Objective	Evaluating the possibility of project execution	Securing sustainability of the project
Technologies	Validity of plan, design and selection of equipment	-
	Validity of construction techniques	-
	Validity of maintenance and management plan	-
Economic and Finance	Benefits to economics in Vietnam (Economic IRR: min. 12%)	Maintaining benefits directly or indirectly by the project
	Investment possibility by private investors	Maintaining profitability, financial stability, and effectiveness of assets
	Validity of price decision based on forecasting precise demand	Appropriate action for changes based on forecasting precise demand
	Validity of investment and operation cost	Additional investment depending on demand increment, management of investment cost, and continuous operation improvement
Investment Regime	Compliance with Vietnamese laws	Action for change in law
	Validity of risk allocation Risk mitigation	Action for risks

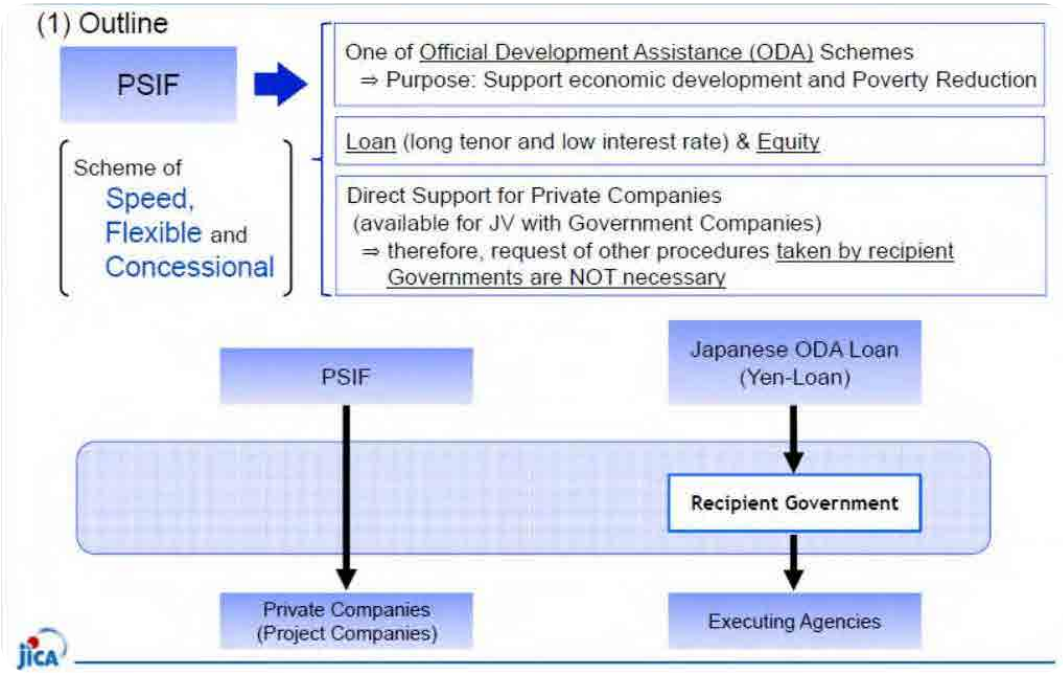
	(Support from government)	
	Selection of JV partners	Validity of role allocation of the private and public sectors
Environmental and social considerations	Consideration on social environment	Consideration on social environment

Source: JICA Study Team

15.4. Possibility of Private Sector Investment Finance

(1) JICA Private Sector Investment Finance

The JICA Private Sector Investment Finance (PSIF) supports projects which contribute to development in developing countries by the private sectors through its financing and investment. The aim is that JICA, which has a lot of experiences in investments in developing countries, makes the projects viable when the projects cannot receive financial supports from the private banking sectors through taking risks by JICA.



Source: JICA

Figure 15.4.1 JICA Private Sector Investment Finance (JICA)

(2) Feature of PSIF

As shown in Figure 15.4.1, JICA PSIF is a long-term and low interest loan. Unlike ODA, JICA PSIF does not need governmental guarantee and provides loans equivalent to non-recourse project finance. The project can get JICA PSIF on the condition that Japanese private sectors join the project. The maximum financed amount of JICA PSIF is 70% of the total investment cost.

(3) Merits of PSIF

PSIF is able to improve the profitability of the private sectors as its interest is lower than the long-term loan interest of commercial banks in Vietnam. Improvement of the profitability will increase the investment amount by the private sector, which will then reduce the investment amount by the public sector. Therefore, PSIF can reduce the amount which the public sector has to bear in the PPP infrastructure project, which can also reduce the amount which the Government of Vietnam has to bear in the Project as well as improve the profitability. As PSIF can also provide 20 years (maximum 25 years) long-term loan, it is desirable for the CTT Project which lasts for many years.

(4) Other Possible Options in Raising Funds

Other than the loan directly lent to SPC by JICA, another option is two-step loan in which SPC obtains loan through commercial banks in Vietnam. However, considering the huge investment amount required in the CTT Project, it is difficult for commercial banks in Vietnam to lend this amount taking their capital capacity in finance into account.

With regard to other options, it is also difficult to use Export Credit Agency (ECA), such as International Finance Corporation, because they will find it difficult to fund coal-fired power plant-related projects given that the World Bank, European Investment Bank, and European Bank for Reconstruction and Development are following the policy of the "National Climate Change Action Plan" of the United States of America.

It is also difficult to find non-recourse project finance from Japanese commercial banks because they will have difficulty taking risks for huge and long-term loan in a developing country without any guarantee from ECA, and obtaining the guarantee from ECA will be difficult as explained above.

Considering the above, it is very important to utilize JICA PSIF in order to realize the CTT Project.

(5) Subjects of JICA PSIF

As JICA PSIF is denominated in yen only, the private sector receiving this loan will manage to transfer the exchange rate risks to the Government of Vietnam or off-takers as it is impossible for the private sector to bear exchange rate risks. JICA studies the possibility of introducing PSIF denominated in local currency. However, Vietnam currency is not subject to this consideration by JICA. It is expected that loan denominated in Vietnamese dong or US dollar is realized at an early date as it is also agenda for the Government of Vietnam to bear exchange rate risks.

Chapter 16. Financial Analysis of Related Organization and Firms

This CTT Project assumes the establishment of JV based on the Investment Law. Potential partners in Vietnam are Vinacomin, EVN and PVN. It is hard to obtain financial data of Vinacomin and EVN, so it is too difficult to analyze them in terms of the financial aspect. However, they are representative state-owned companies in Vietnam, so they are expected to have creditability like that of the Vietnamese government. PVN is also a state-owned company, but PVN's annual report is made public on PVC's home page. Financial data from the 2012 annual report is attached in the next page onward and a summary for the period from 2009 to 2012 is given below. Sales and profit are going up steadily and indexes like ROA are good enough.

Table 15.4.1 Financial Summary of PVN

Trillion VND

	2009	2010	2011	2012	2013
Gross sales	140	241	332	372	406
Operating profit	33	43	50	58	66
Net profit	21	30	34	42	46
Total assets	353	466	578	631	710
Owner's equity	185	232	264	318	352
Operating profit ratio	23.7%	17.8%	15.1%	15.5%	16.3%
ROA	6.1%	6.3%	6.0%	6.7%	6.5%
ROE	11.6%	12.7%	13.0%	13.3%	13.1%
Equity ratio	52.3%	49.8%	45.7%	50.4%	49.6%

1USD ＝ 213,500VND

Million US$

	2009	2010	2011	2012	2013
Gross sales	655	1,131	1,555	1,743	1,902
Operating profit	155	201	234	270	310
Net profit	100	139	161	199	216
Total assets	1,655	2,183	2,705	2,956	3,323
Owner's equity	866	1,087	1,236	1,489	1,648
Operating profit ratio	23.7%	17.8%	15.1%	15.5%	16.3%
ROA	6.1%	6.3%	6.0%	6.7%	6.5%
ROE	11.6%	12.7%	13.0%	13.3%	13.1%
Equity ratio	52.3%	49.8%	45.7%	50.4%	49.6%

Source: JICA Study Team

Chapter 17. Feasibility of the Project

17.1. Feasibility of the Project Before Implementation

(1) Result of Economic Analysis

1) Benefit to Economy of Vietnam

In the southern part of Vietnam, there are a lot of coal-fired power plants (CFPPs) being constructed and plans of construction of CFPP. It is not economical that each IPP investor constructs a huge Coal Transshipment Terminal (CTT) and goes ahead with dredging project in a disorganized manner. As mentioned in Chapter 8 and Chapter12, the economic IRR of the Project is more than the social discount rate in all the demand scenarios.

2) Benefit to CTT Users

As mentioned above, the Project can contribute to the Vietnamese economy as CTT users can import cheaper coal through the CTT compared with freight merit of larger vessel even if the CTT users bear the terminal handling charge estimated in this report. Especially in the light of stable procurement from various supply sources, it is very important for CFPP to buy not only from Indonesia but also from Australia. In the current condition, it is difficult to import coal from Australia for CFPPs other than the Duyen Hai CFPP. The freight merit for the Duyen Hai CFPP is also increased if they import coal from Australia; therefore, it will be remarkable for the CTT Project to contribute to the Vietnamese economy if users import coal from Australia.
Besides, the Project can contribute to other potential CTT users other than CFPPs, such as cement producer, paper producer, etc., although the benefit to these industries is not included in this report.

As mentioned in Chapter 5, estimates of ocean freight for each vessel type are shown in Table 17.1.1.

Table 17.1.1 Ocean Freight for Each Vessel Type

This information includes trade secrets.

Source: JICA Study Team

Based on the freight table, total reduction amount of ocean freight can be found in Table 17.1.2 and Table 17.1.3 below. From this table, it can be seen that the Project can contribute to CTT users since total reduction amount of the freight is bigger than the total amount of THC which will be paid by CFPPs to SPC. (Terminal Handling Charge (THC) was calculated to fulfill the required equity internal rate of return (IRR) of the Special Purpose Company (SPC).)

Table 17.1.2 Comparison of Freight Merit and THC per Year (Scenario 1)

This information includes trade secrets.

Source: JICA Study Team

Table 17.1.3 Comparison of Freight Merit and THC per Year (Scenario 2)

This information includes trade secrets.

Source: JICA Study Team

As an extreme example, CTT is not necessary in case coal is transported directly from Indonesia to Vietnamese power plants such as Long Phu and Song Hau by 10,000 DWT barge. However, huge increase of ocean freight is expected for barge transport from Indonesia to Vietnam, which is USD 482 million per year in the 3rd Phase (Scenario 1). And this method is not realistic due to the following four reasons:

i) Safety of voyage (risk of capsizing and sinking, health and safety of crew);

ii) Necessity of bigger coal stock yard due to stoppage of voyage by monsoon;

iii) Incease of congestion at unloading berth due to fluctuation of transit time between Indonesia and CTT / necessity of expanding the unloading facility of CTT; and

iv) Difficulty of securing approx. 30 x 10,000 DWT barges in the 1st Phase because there are no such numbers of 10,000 DWT barges in the market.

In Section 5.1.1(2), the freight merit of changing vessel type from Handy to Panamax in case 50% of coal or 100% of coal is from Australia was mentioned; however, this comparison is not based on

realistic terms because Handy size of vessel cannot go into the Hau River for Song Hau and Long Phu. In addition to that, CFPPs other than the Duyen Hai CFPPs cannot use Duyen Hai Port since the capacity of Duyen Hai Port is limited.

3) Feasibility of the Project for the Private Sector

As mentioned in Chapter 8, the feasibility is evaluated by calculating THC per t which fulfills the required equity IRR of the public investor of SPC.

Although it is common to calculate a minimum rate of return for a capital investment project (hurdle rate) by "capital cost plus spread between domestic and overseas interest rates", the study team set 17.2% as the conservative hurdle rate. The study team recognizes that this level of profitability is sufficient for private investors. (THC which is calculated with this hurdle rate is still beneficial to CTT users.)

As the CTT Project needs huge investment cost for lower infrastructure such as land, stock yard and pier for transshipment, it is essential that the project utilize official development assistance (ODA) for lower infrastructure under a PPP scheme. Besides, risk sharing by Vietnamese government for some issues which private investor cannot control, and low cost and long-term funding for the project is necessary for the private investor.

(2) Key Issues for Implementation

1) Government's Support and Precise Demand Forecast

The important factors which will affect the profitability of the project are that the project decides the terminal handling charge, which is a main revenue source of the project, in a rational manner and that the project secures demand by users for a long time. In order to realize these matters, the risk taken by the Government of Vietnam, which is mentioned in Section 15.1, and the government's support in coordinating among the interest of the various related parties are very important.
When the CTT Project starts, if the number of CFPP using the CTT decreases and the volume of demand of the CTT is smaller than the volume assumped in the investment plan, introducing take-or-pay method should be considered in order to secure the profitability of the project, but this will result in a high terminal handling charge. Therefore, precise demand forecast with government's support is quite important factor for the project.

Investment by the public sector to the project and profitability of the project can be worked out by utilizing JICA PSIF long-term and low interest loan and cannot be realized without stable profit supported by the government and others.

2) Validity of Investment and Operation Cost

It is difficult to precisely forecast the power demand in Vietnam. The future subjects for the detailed design stage are increasing the competitiveness of the terminal handling charge and improving the profitability through continuous review of capital cost and operation cost so that the viability of the project will improve even if there is demand change. As the current terminal handling charge is a conservative estimate, there is still room to further reduce the cost.

As mentioned in Section 6.2(7), the lower infrastructure is an asset of the Vietnamese government, and will have economic value after the project term. Therefore, the necessary fund, which is assumed to use JICA ODA loan, for the lower infrastructure should basically be prepared and borne by the Vietnamese government. However, the study team assumed in this study that SPC will bear 50% of the funding cost, which is the principal and interest of ODA loan, for the lower infrastructure as "land usage fee" to the Vietnamese government. Therefore, the operation cost will be changed by the ratio of this cost sharing.

(3) Compliance with Vietnamese Laws and Validity of Risk Allocation and Method of Risk Mitigation

PPP-related laws and BOT-related laws are expected to be replaced by a new PPP/BOT decree. As the contents of this decree have not been finalized, the study team recommends that the CTT Project is implemented based on the Investment Law and under a joint venture structure. The study team is assuming that SPC can have the government support, which is the same level as that under the PPP/BOT decree, under the Investment Law.

(4) Maximization of the Total Economic Benefit to Vietnam by "Total Optimization"

To establish stable, cost competitive, and environmentally sound coal procurement for the world's largest scale CTT, not only stable and competitive CTT operation but also investment and construction of operation scheme for total optimization with the viewpoint of total coal value chain from coal procurement, transportation, CTT operation and CFPP are necessary. Further investigation with potential CTT users is required to realize the total optimization.

(5) Selection of Enterprising Body of Joint Venture

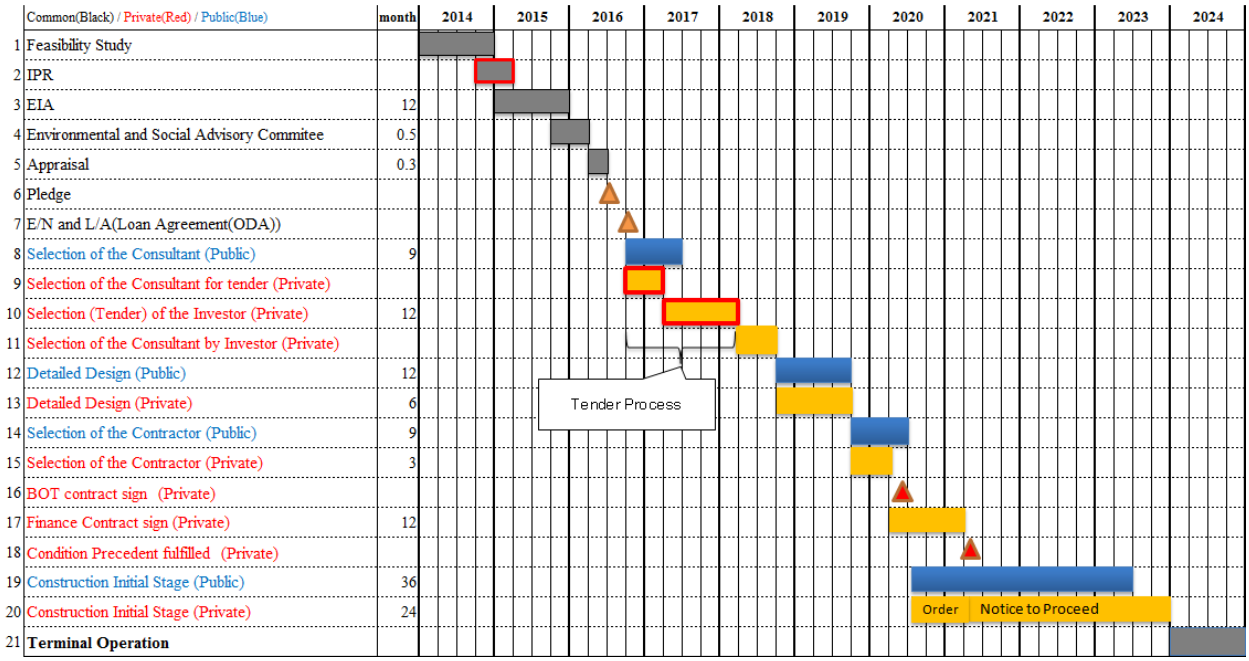
Selecting the enterprising body of the joint venture needs to be studied. As the CTT Project is a port infrastructure with high public nature, the enterprising body in Vietnam should be able to smoothly communicate with the Government of Vietnam, ASB, customers including CFPP and others. In the interest of securing stable profitability, it is an option to invite business operators of CFPP directly to the CTT Project. The private sector is required to provide knowhow on the management and operation of the CTT utilizing its experience in managing and operating the CTT in Japan. Improving profitability and quality of service in the CTT Project is required by utilizing Japanese company which has high technology and competitiveness in design, construction, procurement, maintenance and

management.

(6) Assumed Schedule After the Feasibility Study

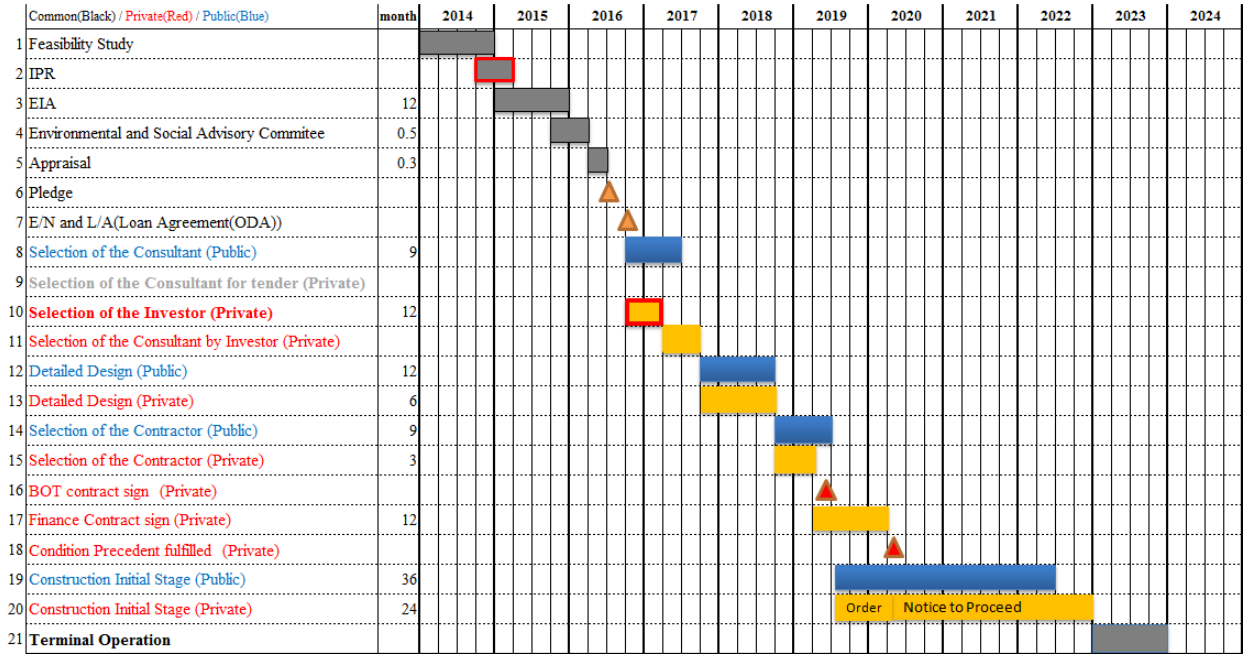
The JICA Study Team assumes the rough schedule of implementation of the project after completing the Feasibility Study as shown in Table 17.1.4 below.

Table 17.1.4 Assumped Schedule After Feasibility Study with Tender Process



Source: JICA Study Team

Table 17.1.5 Assumed Schedule After Feasibility Study without Tender Process



Source: JICA Study Team

Chapter 18. Environmental and Social Considerations

18.1. Background and Current Situation of the Project

Recently in the southern part of Vietnam, several coal-fired power plants such as Song Hau, Duyên Hải, and Long Phu are under construction or planning stage to cope with the rapid increase in demand for electricity power. As for coal used for power generation currently, it is sourced and covered domestically from Hon Gay. However, when these power plants gets online, the coal demand will exponentially increase and the need to import coal for power generation is inevitable due to the scarcity of production and deposits of coal within the country.

Most of the coal-fired power plants are to be constructed along the coastline or on river banks in southern Vietnam so that the mode of transport for coal is planned using the waterways. These power plants are to be located along the Mekong River and coastal areas, but the water depth of waterways is not adequate for large-scale coal transport vessels to enter the port and to reach the landing jetty. In order to let the coal freighters approach the power plants directly, it is suggested to build an import coal transshipment terminal to realize better management of coal-fired power plants in southern Vietnam in the future.

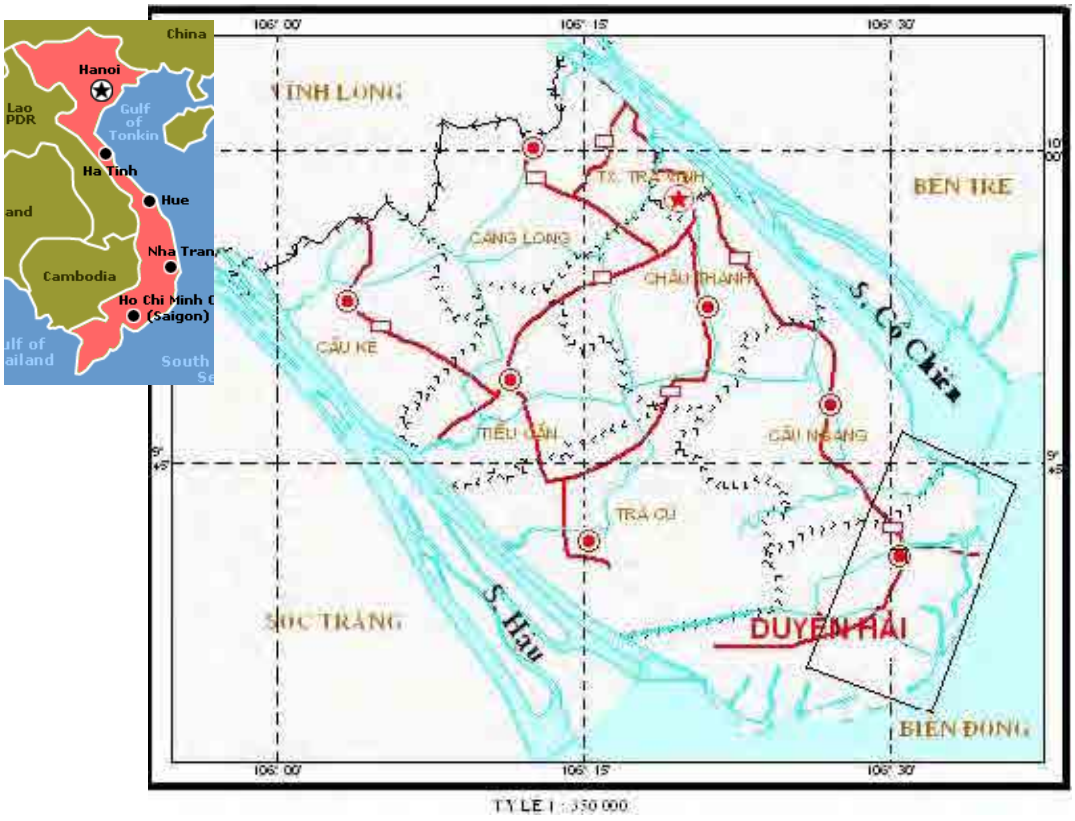
In 2012, JICA has set up a PPP project scheme and this Import Coal Transshipment Terminal Project (hereinafter "the Project") is a part of this PPP project. Consideration for the environment and social issues has always been the crucial factors in implementation of projects especially in infrastructure development sector as several international schemes suggest through formulating guidelines on this topic. Projects financed by international financial institutions (IFIs) strictly enforce to include the environmental and social consideration from the planning stage. In JICA projects, they need to align with the new JICA Guideline publicized in April 2010 and to put into consideration the environment and society in conducting aid projects.

The following three large-scale projects are in progress according to the government-approved development plan in Duyên Hải District, Tra Vinh Province where the Project is scheduled to be carried out:

- Construction of Duyên Hải coal-fired power plant
- Construction of harbor facilities of Duyên Hải coal-fired power plant
- Construction of Hau River bypass canal

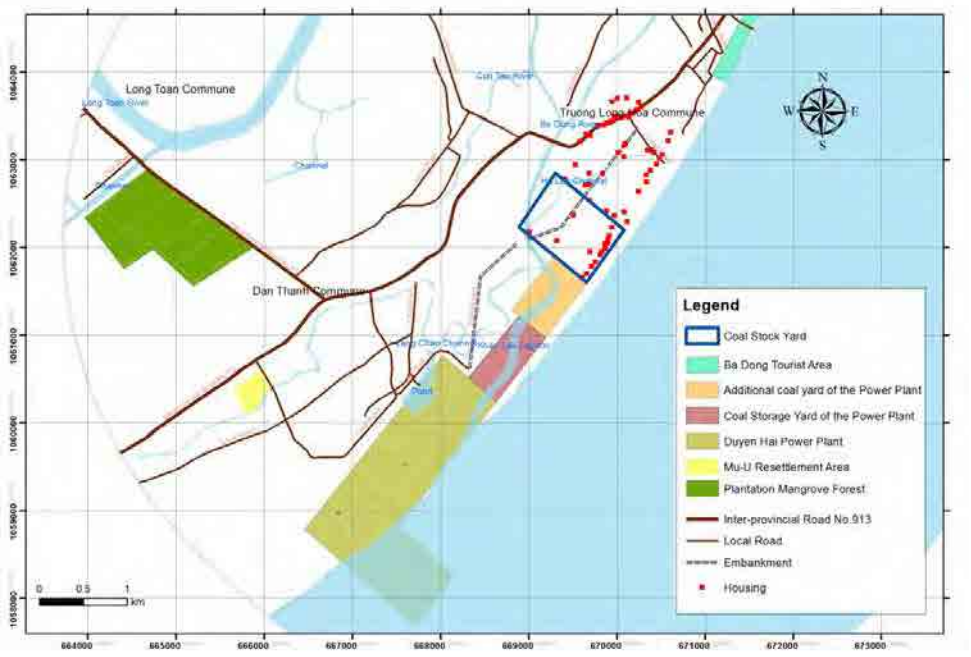
The location of import coal transshipment terminal is planned next to Duyên Hải coal-fired power plant which is currently under construction in the coastline of Tra Vinh Province by the government. This power plant (area: 149 ha) is designed to be equipped with three units and two of them are currently under construction (refer to Appendix E-1 for pictures). For this power plant project, approximately 150 fishermen were resettled and moved to a new place because they used to live in the project area. Resettlement was organized and initiated by the people's committee which prepared the

resettlement area near the power plant and the resettlement process was completed by 2010. Figure 18.1.1 shows a map of Tra Vinh Province and Figure 18.1.2 shows the map of the proposed coal stock yard.



Source：Prepared by the JICA Study Team

Figure 18.1.1 Location of Tra Vinh Province



Source ：Prepared by the JICA Study Team

Figure 18.1.2 Map of Prospective Coal Stock Yard

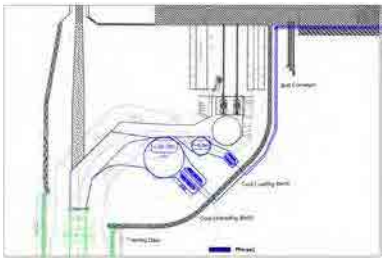
18.2. Summary of the Project

The Project site is next to a coal-fired power plant in Duyên Hải District, Tra Vinh Province which is currently under construction. The Project description which is estimated to bring impact on the natural and social environment is shown in Table 18.2.1 below.

Table 18.2.1 Summary of Proposed Project

No.	Items	Contents
1	Unloading berth	300 m (2 units): 16.0 m depth (1st Phase, 2nd Phase) 300 m (2 units) + 350 m (2 units): 19.0 m depth (3rd Phase) Unloader: 2,500 t/ha x 2 units Planned to be constructed in the harbor of the power plant in the coastal area
3	Coal stock yard	Coal demand: 8,530,000 t/year, Area：22 ha (1st Phase) Coal demand: 17,800,000 t/year, Area：40 ha (2nd Phase) Coal demand: 31,090,000 t/year, Area：72 ha (3rd Phase) Facilities of disaster prevention or dust control Plan to construct around power plant at coastal area
4	Equipment	Unloader, ship loader, belt conveyor, etc.
5	Control tower, maintenance shop	Planned to be constructed in the coal stock yard around the power plant
6	Channel, turning basin	Channel: -14.5 m, Turning basin: -16.0 m
7	Facility of environmental considerations	Catchment system of surface water and coal、sedimentation pond, wall for dust prevention, buffer zone including greenbelt zone
8	Construction condition	Refer to Section 5.4

Source：JICA study team



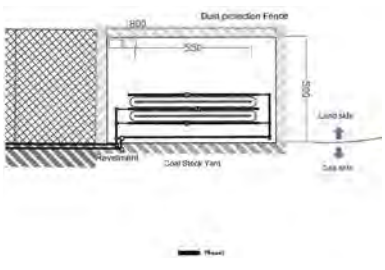
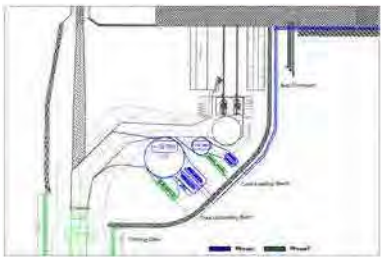


Figure 18.2.1 Port Facility Plan Short Term



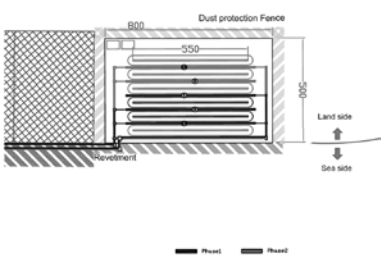
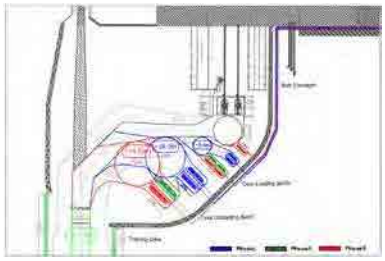


Figure 18.2.2 Port Facility Plan Middle Term



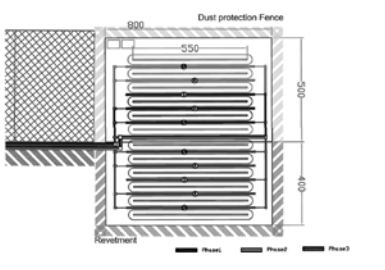


Figure 18.2.3 Port Facility Plan Long Term

Source：JICA study team

18.3. Baseline of Natural and Social Environment

To add more details about the Project area, the Project will emerge on the delta of the Mekong River and will reside within two communes called Dang Tang and Cholon Phoa, Duyên Hải District in Trà Vinh Province. Trà Vinh province is located between the two rivers named Tien and Hau, which flow into the sea at the estuaries of Cung Hau and Dinh An. The province has 65 km coastline and is located on the right bank of the Hau River Bypass Canal that branched off from the Mekong River, which is also under construction. It is situated about 200 km towards the southeast from Hồ Chí Minh City. A national statistic record says Duyên Hải District has 420 km^2 area, and its population is 102,958.

The Project area is in the coastal area on the east seashore and surrounded by many lakes and marshes, and a part of those used to be aquaculture. The major industry in Duyên Hải District is agriculture and fishery, which employs many residents who live in the district. Along the main road which traverses from the city center of Trà Vinh City to the Project area, many aquaculture ponds are seen as fish farming is prosperous in this area. A 40 km paved road with 5-6 m width links to the Project area from the center of Tra Vinh Province through Provincial Road No. 913 and Commune Road No. 84. This road is also utilized as an access route for the Duyên Hải coal-fired power plant project. Many retailers, residential buildings, and small-scale factories are observed along this road.

18.3.1. Natural Environment

The Project area belongs to the tropical monsoon climate zone and has two seasons called southwest monsoon (dry season: November-March), and northeast monsoon and southeast monsoon (rainy season: May-October). In the rainy season, wet atmosphere comes along as 3-4 m/s winds from the Gulf of Thailand and it brings heavy rainfall.

(1) Weather

Average annual temperature in Tra Vinh Province is as high as 26.6℃ and the highest temperature changes from 18.5 to 35.8℃. Humidity fluctuates between the dry season and rainy season but the average is between 80 to 85%. Additional meteorological conditions such as precipitation, average temperature, and average humidity will be described in Section 2.1.

(2) Geography and Topography

The Project area is located in the watershed of Mekong River in southern Vietnam and the coastline facing the East China Sea. It has unique geography in vast area formed by soil sediments which traveled from the upper stream of the Mekong River and accumulated over many years. Many artificial aquaculture ponds are present in the coast and inland area. Also, agricultural activity is common in the rural area, with mostly rice cropping in the hinterland area. The topographic profile of the coastline area consists of about 2 m sand layer on the surface and clay layer which is very soft ground. Below these two layers, there is a hard clay layer. At the bottom of the layers, relatively tight

sand layer and hard clay layer repeatedly pile up each other. This condition gives reliability as supporting ground for the pile foundation.

(3) Biodiversity

Plant variety ranges from 115 species in 45 categories in Duyên Hải area. Although many kinds of vegetation are also seen in the agricultural land and residential area located in the Project area, most are trivial weeds and their value in terms of biodiversity is negligible. Notably, a barely reserved mangrove within the Project area and a mangrove forest planted for the purpose of countermeasures against soil erosion in the coastline, but they are recognized as general forestation and only a few species of mangrove trees inhabit the area. Mangroves (Rhizophora apiculata and Avicennia alba) grow in the wetlands and most of them naturally grow. They spread in the lowlands affected by seawater in most cases. In this environment, Nypa fruticans, Avicennia alba, and Rhizophora apiculata are the dominant species. In the mangrove forest along rivers and canals, there are species which are categorized as "frequent" in Vietnam's Red Book 2007, so it is necessary to conduct additional survey during the construction stage. Condition of ecology was classified according to five categories, namely: very common, common, frequent, uncommon and sparse, based on the Vietnamese standards.

Two species of mice, which were found during the survey in the mangroves, are not ecologically valuable. As for the birds, 36 species are inhabitants in this area and they are also commonly observed nationwide and around the globe; they are not considered as specifically important. These birds are generally seen in other wetlands such as in freshwater wetlands. In the Project area, natural vegetation rarely remains and is changed to farmland. Little mangrove forests survive in the proposed ash dump area of the planned power plant project in Dan Thanh Commune.

(4) Fishery Activity

In Truong Long Hoa Commune, there are 176 fishing boats and 70 of them are equipped with motor-powered engines which is 15-50 CV engine (1 CV=736 W). Capture of fish with "fish trap" in the water stream of the rivers and lakes is used by 45 households of fishermen. This commune's gross fish catch was 4,160 t in 2013. Most of the fishermen operate within 12 km from the coast using small boat. At the peak, 65 boats operate at the same time on the sea. About 30 larger boats (CV>30) work in the further fish grounds in the southern provinces such as Kien Giang and Ca Mau Province. Currently, no fisherman operates in the area which is being planned as alternative offshore unloading coal terminal; however, some may need to detour to reach to their fishing grounds. About 1,000 households are engaged in aquaculture or catch fishes for a living. The average size of the aquaculture pond of a household living in this area is about 8,000 m^2. Also, four shrimp processing factories are operating in this area. Figure 18.3.1 shows a map of the fishing grounds of the coastal area.

Source：JICA Study Team

Figure 18.3.1 Map of Fishing Grounds of the Coastal Area

18.3.2. Social Environment

(1) Population

The population of Tra Vinh Province is about 1.1 million and comprises of Kihn, Khmer and Chinese as major ethnicities. In this province, 30% are Khmer. In the Project area, the population is 102,958, the number of household is 24,396, and population density is 244/km^2. This demographical information of the Project area is shown in Table 18.3.1. Land use of the area is shown in Table 18.3.2, and a current land use map of proposed coal storage yard is shown in Figure 18.3.2.

Table 18.3.1 Demographical Information of the Project Area

Commune	Total	Population		Households	
		Male	Female	Urban	Rural
Dang Tang	8,214	4,137	4,077	0	8,214
Truong Long Hoa	7,649	3,869	3,780	0	7,649

Source：Duyên Hải District Statistical Data 2013

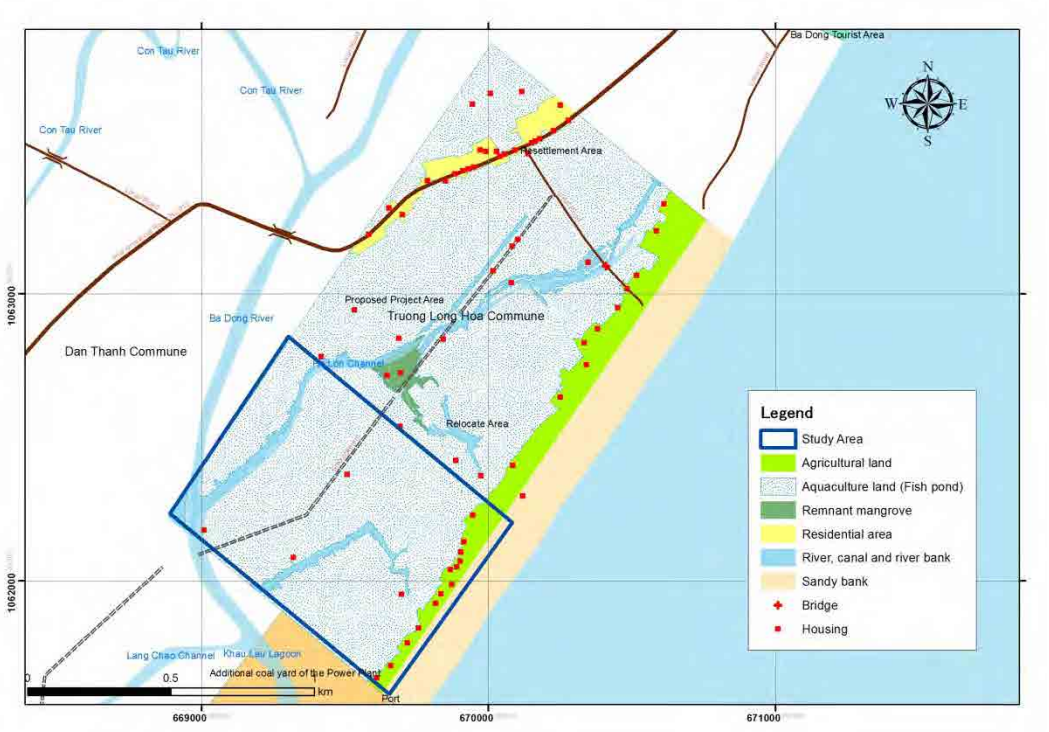
(2) Land Use

Table 18.3.2 Land Use of Duyên Hải District

Type of land use		Area (ha)	Ratio (%)
1	Agricultural land	25,816.50	61.46
1.1	Paddy field - annual grain	3,444.85	8.20
1.2	Perennial grain	1,580.43	3.76
1.3	Others	234.39	0.56
1.4	Cultivation	20,556.83	48.94
2	Forest	6,776.61	16.13

2.1	Natural forest	2,634.13	6.27
2.2	Afforested area	4,142.48	9.86
3	Land for special purposes	8,208.07	19.54
4	Residential area	491.50	1.17
5	Unused land	714.30	1.70
Total		42,006.98	100.00

Source：Duyên Hải District Statistical Data 2013



Source: JICA Study Team

Figure 18.3.2 Current Land Use Map of Proposed Coal Storage Yard

(3) Industry and Economy

In 2013, the communes' GDP reached VND 183 billion (USD 8.71 million) and it comprises of 52.5% from fishery and cultivation, 20.45% from agriculture, 0.86% from forestry, 10.55% from handcraft and construction, and 15.64% from commercial items. Annual income per capita achieved about VND 24.5 million (about USD 1,160) in 2013. In Duyên Hải District, there are about 200 factories and handcraft enterprises and most of them are small-scale, family-owned businesses. In the city, several large-scale factories are constructed for processing fish caught in this area. Total number of tourists entering to Duyên Hải District was recorded at 317,000, and most of them visited coastal area and Ba Dong Beach. Major business of the residents in the proposed coal stock yard is fishery and agriculture.

Their main income source is fishery. They earn 52.5% from fishing and 13% from cultivation of shrimp. Income from agriculture follows as it brings 26.1% of earnings.

(4) Social Infrastructure

In the proposed Project area, almost 100% of residents have access to clean drinking water and the electricity network service by EVN (Electricity of Vietnam) covers 98.9% of the area. As for common infrastructures in Truong Long Hoa Commune, one public kindergarten and three formal schools (higher education) are constructed. Medical station has a role of providing medical service to the community members. Main roads near the proposed Project area are paved and a part of them have constructed greenbelt with tree planting and lawn grass in the centerline.

(5) Power Plant Construction Project Conducted in Neighboring Area

This Project site is planned next to Duyên Hải thermal power plant currently under construction, and it plans to utilize a part of the power plant area as a coal stock yard. Initially, 22 ha is planned to be used in the 1st Phase. The Project has already completed land reclamation including site preparation such as leveling of the ground, cutting of trees, and removal of residential facilities. In order to construct the coal transshipment terminal, it will additionally require land reclamation and leveling for site preparation. (See Appendix E-1: Current picture of power plant construction area.)

For the power plant construction project, land acquisition and resettlement for 150 local residents were implemented from 2001 and completed already. Along with this power plant project, 22 households moved to nearby resettlement area (Mu U Hamlet) which was set up by the people's committee. This resettlement area is located about 300 m away from the power plant and is adequately provided with public infrastructure such as roads, electricity, water supply, drainage facility, and primary school with kindergarten.

18.4. Vietnam's Environmental Consideration

In accordance with Vietnamese law, the implementing body of the Project is required to prepare the EIA report at the same time of preparation of the Feasibility Study or Investment Report, and then submit it to the authority which evaluates and approves the report. As for the preparation of the EIA report, the implementing body can establish an organization or hire a consultant. In case there is a change of size, content, starting date, period, and completion date of the project, it is necessary to explain to the EIA authority. It might be necessary to prepare additional EIA report depending on the content of change (Law on Environmental Protection Article 19).

The EIA report needs to include comments from representatives of district, township, people's committee, and community (Law on Environmental Protection Article 20). The following details are indicated in Circular No. 08/2006/TT-BTNMT 3.2):

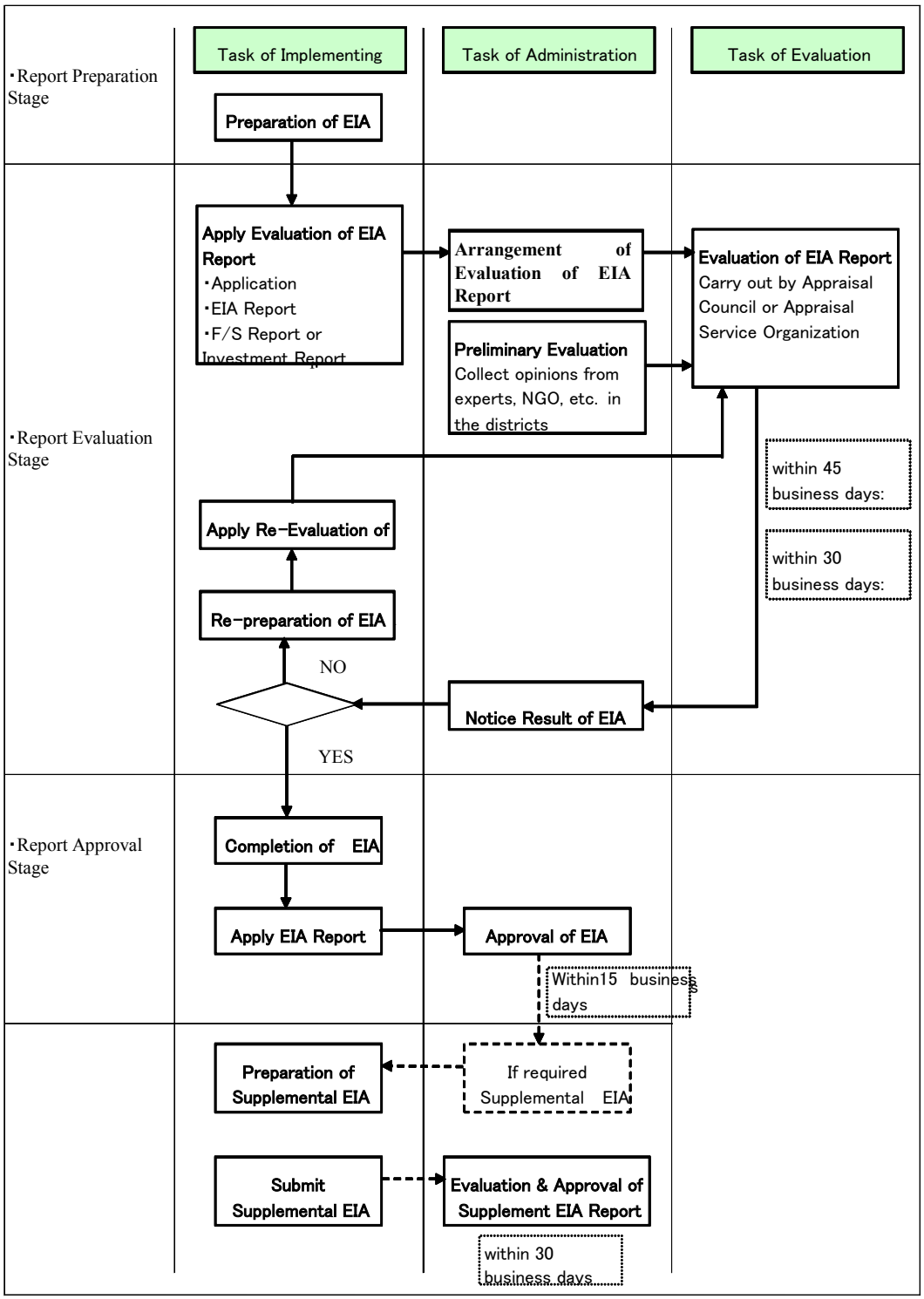
- The implementing body of the project discloses the summary of the project, environmental impact, and the mitigation of the impact, and takes comments in writing from people's committee at the district and national level.
- The implementing body indicates its agreement or disagreement with the comments from the above organizations. In case of disagreement, the reasons are explained.
- The implementing body indicates its agreement or disagreement with the comments collected from relevant authorities. In case of disagreement, the reason is explained and necessary lobbying is conducted.
- A copy of comments prepared by the above and relevant authorities is attached to the EIA report.

Major flow of evaluation and approval after the EIA report was prepared is indicated in Figure 18.4.1. The implementing body of the project applies for evaluation. After the process, it finalizes the EIA report by reflecting the evaluation of the report and applies for approval. After the EIA report is approved, investment, construction, and operation are permitted. These procedures are summarized in the following sections.

18.4.1. Procedure for EIA approval

The new law on environmental protection, which was executed in July 2007, is a replacement of the previous environmental protection law. In August 2006, Decree No.80/2006/ND-CP was issued and it regulates the kinds of project which are required to prepare EIA report and strategic environmental assessment (SEA) report and authorities which conduct planning, evaluation, and approval. Furthermore, in September 2006, Circular No. 08/2006/TT-BTNMT was issued and it regulates the contents and procedures of EIA report and SEA report in detail.

As for a large-scale project, it is regulated that the evaluation committee and authority will conduct the evaluation within 45 days. After the evaluation, the notice of result will be issued to the implementing body. As a result of the evaluation, in case the EIA report is approved, the final EIA report is prepared and the authority needs to approve the final EIA report within 15 days. Also, in case the EIA report is not approved, the applicant revises the report based on the indications and need to get approval. Through these processes, EIA is finally approved by the Ministry of Natural Resources and Environment (MONRE) or Department of Natural Resources and Environment (DONRE). The following Figure 18.4.1 shows the approval process of the EIA report.



Source: JICA Study Team

Figure 18.4.1 Flow of Approval of EIA Report

18.5. Comparison of Alternatives

(1) Zero Option（In case the project is not implemented）

In case that the proposed project is not implemented, construction of unloading jetty on the sea or inside the port area and 22 ha coal stock yard on the land are not necessary, so that this Project will not cause any negative impact on the environment. In case of no coal supply to the power plants, it will become extremely difficult to have a stable generation of electricity in the power plant. There are three targeted power plants and all are large scale. If the coal supply stops or becomes unstable, this would bring significant impact on the economy and people's life in southern Vietnam. It is crucial to achieve stable generation of electricity for economic development in southern Vietnam, so that sustainable construction development plan considering environment, social, and economic conditions should be formulated.

(2) Environmental Condition of Alternatives
Five plans were considered as the possible alternatives in this study. In the following sections, each environmental condition is summarized. The details of the five plans are described in Section 5.2.3.

Alternative Plan A

The Project area is located in the inland area of existing dike along the seaside area. There are many fish ponds located in this area and cultivation is conducted. In the inland area, small size of settlement conducts aquaculture and agriculture. Large-scale land reclamation is necessary because there are many fishponds utilizing the existing boggy area. There are no precious species and only few mangroves in this area.

Alternative Plan B

The Project area is located in front of the road of Duyên Hải coal-fired power plant which is currently under construction. Along the road, there are approximately 80 houses, small shops, restaurants, and small-scale factories and it is difficult to resettle the residents. Also, in the back side of the area, land reclamation is ongoing, so it is not suitable as the project site in terms of environmental consideration.

Alternative Plan C

The Project area is located in the neighboring area of the power plant under construction. As for the power plant project, land acquisition and resettlement are completed. In this area, there are settlements where fishermen and farmers reside. It is estimated that approximately 20 households will require resettlement from the area in the final stage which is 72 ha of the project area. There are few mangroves and no precious species in the area. Fishermen who practice fishing along the seaside

reside in the area. It is necessary to conduct land reclamation since there are fish ponds utilizing the existing boggy area and rivers.

Alternative Plan D

The Project area is located next to power plants which are under construction and along the seaside. The area is shoaling beach and it is necessary to conduct large-scale land reclamation at the seaside. There is no existing vegetation, so it is unlikely to impact on ecosystem. There are no residents in this area and no possibility for land acquisition and land reclamation.

Alternative Plan E

The Project area is located next to Hau River Bypass Canal in the ocean and outside of the existing dike. In this area, there is a mangrove forest which was planned for the prevention of denudation with World Bank fund, so it is necessary to cut a large amount of mangroves. In this area, there are fish ponds and a watching house but no permanent residents, so necessity of additional land acquisition is less. The area is shoaling beach and large-scale land reclamation at the seaside is needed during the construction stage.

18.6. Terms of Reference (TOR) for Scoping and Environmental Consideration Survey

The purpose of scoping is to select the evaluation indicators related to the environmental and social impact which the Project could bring and to decide the methodology of survey. The result of scoping is shown in Table18.6.1 and the description of the survey's TOR is detailed in Table 18.6.2.

Table 18.6.1 Result of the Scoping

No.	Impact Factors	Before and During Construction	During Operation	Reason
1	Involuntary resettlement	-B	D	(Before construction) No involuntary resettlement of residents is needed in the proposed construction work for unloading facilities. There are two scenarios: One is to construct unloading facilities of coal on the sea apart from the coast and the other is to construct them inside of the port area. A coal stock yard is planned to be constructed adjacent to the existing power plant. In case of utilizing the current power plant's area, resettlement had been completed and no additional involuntary resettlement is necessary. In this project, additional land acquisition and resettlement for about 20 HH is expected(3rd Phase).
2	Local economies, such as employment, livelihood, etc.	+B	+B	(During construction) New job creation is prospected for construction. (During operation) As this project is a large-scale development, it will create jobs for the local residents. The project will result in overall socio-economic improvement of people living around the project area.
3	Land use and utilization of local resources	-B	D	(During construction) Local fishermen conduct fishing operation by small boats, so some impact is expected to occur to them. The coal stock yard is planned to be located in the coastal area and inside of the existing power plant area where land acquisition was already completed. As for the necessary new areas, land acquisition of about 22 ha is expected (1st Phase). In this area, farming and aquaculture are commonly conducted by local residents. As a result, this project would bring certain impact on local land usage.
4	Social institutions such as social infrastructure and local decision-making institutions	D	D	(During construction) No residents live in the prospected Project area in the construction stage; only a limited environmental impact would occur.
5	Existing social infrastructures and services	-B	D	(During construction) Increment of construction vehicles will increase environmental impact in terms of air pollution, noise and vibration. However, no one lives in the proposed Project area. (During operation) As transportation of coal would be done by sea transport using vessels, no environmental impact would be anticipated.
6	Poor, indigenous, or ethnic people	D	D	(During construction) No one lives in the prospected Project area. The surrounding area is not inhabited by residents categorized as poor, indigenous people or ethnic minority. There are several Khmer temples in Tra Vinh Province which attract tourism.
7	Misdistribution of benefits and damages	D	D	(During construction) (During operation) Since land acquisition and resettlement of the residents were completed by the power plant project, no misdistribution of benefits and damages is expected. As for the newly acquired land for coal stock yard, no impact is anticipated if the Project is carried out according to the Vietnamese laws and regulations.
8	Cultural heritage	D	D	(During construction) (During operation) The Project area is located in the coastal area, and no historic ruins or cultural heritages are found. No impact on the environment is anticipated.
9	Gender	D	D	No negative impact on gender is anticipated by this Project, but it will be confirmed through the field survey.

10	Children's rights	D	D	No negative impact on the children's rights is anticipated by this Project, but it will be confirmed through the field survey.
11	Local conflicts of interest	D	D	(During construction) (During operation) Since land acquisition and resettlement of the residents were completed in the power plant project, no impact is anticipated if the Project is carried out according to the Vietnamese laws and regulations.
12	Water usage or water rights and communal rights	-B	C	(During construction) (During operation) About 20 households live in the proposed coal stock yard (3rd Phase). Most of them are conducting small-scale fishery in the coastal area, and some impact is expected based on the layout of the coal stock yard.
13	Public health	C	D	(During construction) No negative impact on public health is anticipated. However, workers' camp will be constructed during construction stage and there should be necessary considerations for solid waste management system.
14	Hazards (risk) of infectious diseases such as HIV/AIDS	-B	D	(During construction) There might be some possibility for disease to be introduced at the site because of the expected migration of many workers from other regions.
15	Topography and geographical features	-B	C	(During construction) There might be possibility of change of geographical features if large-scale land reclamation is carried out in the coastal area. Some change of the flow regime of silt from neighboring rivers would be expected. High tide and strong wind have possibility of sand sedimentation and soil erosion on the coastline.
16	Soil erosion	C	C	(During construction) (During operation) Soil erosion is observed in the Mekong River and its branches, also soil erosion is found in several points in the coastal area of the Tra Vinh Province.
17	Groundwater	C	C	(During construction) Data on the conditions of groundwater is not available.
18	Hydrological situation	-B	C	(During construction) (During operation) There is a small river which flows near the Project area, and it is under renovation by the Vietnamese army. Also, fish ponds for aquaculture are located around the Project area; it may possibly be affected by the conditions of the layout of the coal stock yard.
19	Coastal zone	C	C	(During construction) (During operation) Proposed unloading facilities are planned inside of the existing port for the power plant. In order to construct an access channel for vessels, dredging is anticipated, and some impact on the water quality is expected. Soil erosion is a unique feature of the Mekong River. Seawater quality along the seashore in the proposed Project area is muddy water and turbidity is high.
20	Flora, fauna and biodiversity	C	D	(During construction) Project site is not located within an area of preserved zone or conservation area for biodiversity regulated by international treaties or national laws. No ecologically valuable flora and fauna are present inside the proposed coal stock yard. The mangrove forests in the coastal area may be affected by the conditions of the layout of the coal stock yard.
21	Meteorology	C	C	(During construction) Civil works implemented in the rainy season (May-October) will be affected by the meteorology; careful attention will be needed. (During operation) For the safety of coal operation, in case of strong wind, loading and unloading of coal shall be stopped (experience record in Japan: more than 16 m/s).

22	Landscape	D	D	(During construction) (During operation) The proposed Project area is not designated as national parks or preservation area. The height of coal stock yard estimated is 15.5 m, and it would form a special appearance during operation, but location is in remote area and beside the existing power plant; as a result, the landscape would be harmonious to some extent.
23	Global warming	D	C	(During construction) (During operation) Increment of coal supply to the power plant would affect global warming, but limited impact would be projected by this Project exclusively.
24	Air pollution	C	-B	(During construction) Some impact of exhaust gas and dust generated from construction equipment is anticipated, but the location is far from residential area, so the effects would be negligible. Vehicles for material transport would pollute the air. (During operation) Massive amount of coal will be imported from Indonesia or Australia every month. The unloaded coal would be stored at the stock yard and delivered by a belt conveyor to the stock yard and smaller vessels (5,000 t). In the dry season, generated fine particles by handling of coal may cause air pollution, so some countermeasures need to be considered.
25	Water pollution	-B	C	(During construction) In a scenario where unloading jetty is constructed in the ocean, dredging will be required for the port and access channel, and the soil and earth of the seabed will be disturbed. As a result, some impact would occur. However, due to muddy conditions of the seawater, the water has low transparency and very low visibility. It is expected that impact of water pollution by dredging work is limited. In case the unloading jetty is constructed in the ocean, it is possible that wastewater from the facility might cause seawater pollution. (During operation) There might be a possibility to cause water pollution from the coal washed by surface drainage including small size of coal and discharged to the sea. In some scenarios, substantial amount of dredging work would be required and in this case, some environment impact is expected.
26	Soil contamination	-B	C	(During construction) In case the coal stock yard is planned in the seashore, large-scale land reclamation work will be needed, and soil contamination is expected.
27	Waste	-B	C	(During construction) It is expected that garbage from the workers' camps and solid waste generated from the construction work will cause some impact. Amount of hazardous waste generated in the Project would be limited. (During operation) In case there are no oil treatment facilities in the port, generated bilge of vessels will be treated at the maintenance dock.
28	Noise and vibrations	C	C	(During construction) (During operation) It is expected that noise sources during construction are piling work and equipment; however, all construction work will be done inside the Project site which is far from residential area; therefore, the impact is negligible. Transportation of machineries and materials will be sea transport; however, some transportation will be done by land which will cause noise and vibration impact.
29	Ground subsidence	C	C	(Before construction) (During construction) For the land reclamation, construction method to avoid ground subsidence is needed, and it is required to further study the countermeasures thoroughly.
30	Offensive odors	C	C	(During construction) No odor source is anticipated in the construction work and no notable source of offensive odors. There might be possibility of impact caused by the thermal power plant.

31	Bottom sediment	C	C	(During operation) (During operation) Coal dusts would be washed away by heavy rains in the rainy season, and surface water includes those dusts that flow into the collection system such as settling basin, and the coals will be removed for discharge to the sea. In addition, the collected coal can be reused.
32	Accidents	C	C	(During construction) (During operation) In the construction of the coal stock yard and the unloading jetty, it is expected that there will be many traffic from the transportation by sea and land transport in the surrounding area. This might cause some impact on the local communities.

Evaluation;
A: Serious impact is expected,
B: Some impact is expected,
C: Extent of impact is unknown,
D: No impact or impact is negligible, no further study required,
+: Positive impact
-: Negative impact

Table 18.6.2 Details of TOR for the Environment and Social Consideration Survey

Environment Factors	Survey Items	Survey Methods
Involuntary Resettlement/ Land Acquisition (if needed)	1) Confirmation of residents in the proposed Project area. 2) Related laws and regulations in Vietnam, examples of previous power plant projects. 3) In case of resettlement, whether a resettlement plan exists, correspondence of implementing institution (VINACOMIN), understanding of gap between JICA's guideline.	1) Confirmation of existence of residents, buildings, land usage, livelihood and baseline in and around Project area by conducting a subcontracted work and a field survey. 2) Consultation with related agencies, information collection through literature review, and identification with JICA Guidelines on Environmental and Social Considerations. 3) Evaluation based on Vietnamese regulations, JICA Guideline, and WB OP.4.12.
The Poor	1) Existence of poor people in the proposed Project area.	1) Consultation with local residents through sub-contracted work and field survey, and evaluation of impact based on literature review.
Local Economy such as Employment and Livelihood, etc.	1) Confirmation of the situation of residents who live in and around the proposed Project area.	1) Consultation with local residents through sub-contracted work and field survey, and evaluation of impact based on the existing data.
Land Use	1) Confirmation of the living situation of fishermen and farmers who live in the proposed Project area.	1) Survey on fishing activities through sub-contracted work, and evaluation of impact based on the existing data.
Existing Social Infrastructures and Services	1) Survey on social infrastructure and services in the proposed Project area.	1) Sub-contracted work and field survey, and evaluation of impact based on the existing data.
Infectious Diseases such as HIV/AIDS	1) HIV/AIDS prevalence and related situation in Duyên Hải District among subcontractors and construction workers.	1) Performance survey on related large projects, and evaluation of impact based on literature review.
Accidents	1) Traffic volume of main road and neighboring roads in the proposed Project area.	1) Field survey and performance survey on related large projects, and evaluation of impact based on literature review.
Alternatives	1) Consideration on layout of coal stock yard (5 scenarios) 2) Arrangement of port and jetty 3) Investigation of methods of construction 4) Study on structure	Taking all the following factors into consideration and making judgment holistically: economy (including maintenance cost), future plans, consideration on environment and social conditions, technical aspects and CP's requirement.
Water Pollution	1) Understanding of current water quality in the coastal area 2) Impact during construction and operation 3) Impact of coal particles scattered by surface water in the rainy season	Study of the results of water quality survey and construction methods will be conducted and study of environmental prediction will be carried out. Since surface water will wash away the coal dusts, the collection system (e.g., settling basin) of the dusts and the conduct of environmental prediction and its evaluation will be studied.
Air Pollution	1) Understanding of countermeasures against coal particles in the dry season	Prediction and evaluation of environment impacts through examination of performance survey on related large-scale projects, installation of dust-proof fence, prevalence survey on sprinkler facility in Vietnam, and selection criteria of buffer zone (green zone). Study of air pollution standards in Vietnam (QCVN) and EU standards.
Noise and Vibration	1) Current traffic volume 2) Impact during construction 3) Impact during operation	Prediction of impacts by conducting a field survey, performance survey of related large-scale projects and its prospected methods of construction, and transportation. During preparation of construction plan, study on traffic mitigation plan during the construction stage.
Bottom Sediment	1) Survey of sea area where dredging is proposed and survey of sea bottom sediment 2) Prediction of impacts during and after the construction	Evaluation of heavy metals and prediction of contamination caused by dredging according to the result of seabed quality survey and study of dredging method. Prediction of impact on maintenance dredging during operation.

Biodiversity	1) Understanding of current biodiversity 2) Impacts during and after the construction	Prediction of impacts on biodiversity from the results of sub-contracted work, field survey, and literature review.
Hydrological Situation	1) Understanding of current hydrological situation 2) Impacts after implementation	Prediction of impacts from the results of field survey and related projects.
Topography and Geographical Features	1) Understanding of current geographical features 2) Impacts after implementation	Prediction of impacts from the results of field survey and related projects.

18.7. Result of Environmental Consideration Survey

The result of the environmental consideration survey is summarized in the following Table 18.7.1.

Table 18.7.1 Result of Environmental Consideration Survey

<table>
<tr><th>Impact Factors</th><th>Survey Results</th></tr>
<tr><td>Involuntary Resettlement/ Land Acquisition</td><td>With regard to the area to be newly required for the coal stock yard (1st Phase: 22 ha), the land acquisition and resettlement will be carried out by the people's committee in Duyên Hải District after the approval of this FS and a Vietnamese investment plan. Within the targeted area, 20 households are residing (3rd Phase). The residents who are engaged in agriculture have obtained a right of land use from the government for long time (about 45 ha). There are roads, river, trees, river banks, coasts, sand hills, and so on as public land managed and maintained by the government. Buildings constructed in the proposed Project area are mostly one story house, made of wooden structure with palm leaf roof, and categorized as national standard category 4, while only a limited number is made of concrete.
As for the land acquisition and resettlement for the power plant project, it was already completed (Total number of resettled residents: 150). In this Project, alternative relocation area was set up in Mu U District and 22 households moved into this area. Currently, the size of the area is 8.1 ha; however, the original plan was 167 ha. The people's committee in Duyên Hải District is planning a new development plan of another relocation site in Con Trung District which is 600 m far from the coast line. Presently, the size of land for a household is 100 m^2 (20 m x 5 m). People's committee has agreed to provide 200 m^2 average size of land to the resettlement residents according to their requirement. The procedure of land acquisition and resettlement will be carried out similar to the power plant project. The comparison of standards of JICA and Vietnam is shown in Section 18.14. .

Table 18.7.2 Conditions of Land Use
<table>
<tr><th>No.</th><th>Segmentation of Lands</th><th>Area-200 ha (Survey Area)</th><th>Area–50 ha (In Survey Area)</th></tr>
<tr><td></td><td>Private land</td><td>181.35</td><td>45.1</td></tr>
<tr><td>1</td><td>Agricultural land</td><td>16.71</td><td>5.2</td></tr>
<tr><td>2</td><td>Cultivation</td><td>158.88</td><td>39.9</td></tr>
<tr><td>3</td><td>Residential area</td><td>5.76</td><td>0</td></tr>
<tr><td></td><td>Public land</td><td>18.65</td><td>4.6</td></tr>
<tr><td>4</td><td>Remained mangroves</td><td>2.29</td><td>0.1</td></tr>
<tr><td>5</td><td>Sandy river banks</td><td>6.60</td><td>2.8</td></tr>
<tr><td>6</td><td>River, canal, and river banks</td><td>8.98</td><td>1.8</td></tr>
<tr><td>7</td><td>Roads</td><td>0.78</td><td>0</td></tr>
<tr><td></td><td>Total</td><td>200</td><td>49.7</td></tr>
</table>
Source: JICA Study Team, 2014</td></tr>
<tr><td>Poor People</td><td>Many of the residents of the Project area (farmers and fishermen) possess a motorbike, a CD player, and an electric fan. Most of the houses are simple and wooden structures, have access to electricity from the national power distribution network, and obtain water from wells. Firewood is commonly used for fuel in half of all households. 75% of residents placed simple pit latrines. Considering all economical and living situation, the residents are not considered as poor. All residents who planned to resettle are members of the Khin Tribe. No Khmer and minority ethnic group are included.</td></tr>
<tr><td>Local Economy such as</td><td>This area used to be prosperous from fishery and agriculture, although recent large-scale project is changing the local economy drastically. Along with the construction of huge power plants, access roads were stretched; accordingly, steelwork factories, construction materials factories such as for secondary products</td></tr>
</table>

Employment and Livelihood	of concrete, and timber processing factories opened in the nearby area. Also, there are increasing numbers of hotels, retail shops, and restaurants targeted to be constructed. For this reason, the large-scale project has brought significant impact to the local economy. In Truong Long Hoa Commune, there are 176 boats and 70 of them are motor-powered. Fishermen who have these boats conduct fishing operation in nearby coastal waters. Approximately 1,000 households are engaged in aquaculture on land. According to the interview conducted with the fishermen, the total fish catch has decreased compared 10 years ago.
Land Use	Vast reclamation work is conducted near the project area in Duyên Hải, and previous lakes and marshes have been changed to yards for the construction of factories. As for fishermen using boat, they also have changed their fishing ground as a result of the construction of the thermal power plant. Resettled fishermen continue fishing in their new relocated place as their base. In the proposed coal stock yard, about 20 households (3rd Phase: 72 ha) live and are engaged in fishery and agriculture. As cultivated land in the coastal area has been eroded these days, it is observed that several local residents moved to another place.
Existing Social Infrastructures and Services	Number of vehicles using the existing road has increased as a result of the large-scale projects. The width of the access road is 5-6 m and it is linked from the center of Trà Vinh City to the construction site. Also, this road was utilized as a basic service road for the daily life in the community. Many local residents use motorbike in this road, and transportation of construction materials using this road will affect profoundly the current traffic system. As a result, it is recommended to carry materials by sea transport. Safety training to the drivers in the beginning of the construction should be undertaken.
Infectious Diseases such as HIV/AIDS	Data on infectious diseases such as HIV/AIDS and similar ones are not available. Large-scale projects implemented in remote area caused troubles of infectious diseases among workers from distant places. Cholera and dysentery, as major infection of digestive organs, and hepatitis are common in April-October when the temperature is high. Malaria and dengue fever are also popular in this season. Tetanus, rabies, sexual diseases, plague, and parasite disease are common any time of the year. In Vietnam, anti-HIV/AIDs measures have been implemented to reduce the number of HIV-infected persons, AIDS patients, and AIDS death toll. As a result, HIV prevalence among adults is 0.26% and lower figure is estimated in the National Strategy for AIDS Prevention 2010.
Accidents	Number of accidents in the prospective Project area cannot be obtained either on land or on ocean. According to a census, more than 10,000 people are killed in traffic accidents, and the record also says 24% of people die of accidents, injury, and addiction (Statistics of Sickness 2010, Ministry of Health).
Study of Alternatives	1) Layout of coal stock yard Layout of the coal stock yard has been studied and five scenarios were developed; the best scenario is for it to be planned next to the ash dump area of the power plant on land. (Details are shown in Section 5.2.3.) 2) Layout of port and unloading jetty As for the unloading jetty, there were two plans to set it up on the sea 15 km away from the coastal line and another is to construct it within the port for the power plant. (Result of the study is shown in Section 5.2.5.) 3) Method of construction and structure Result of the study for the method of construction and structure is shown in Section 5.3.)

Water Pollution

Surface water in the coastal area around the Project area has high concentration of suspended solids caused by erosion; other factors are within the permissible limits. Surface water quality in the residential areas has high concentration of coliform.
Referring the results of the surface water quality monitoring for samples to the Vietnamese standards (QCVN 10:2008/BTNMT), the water source in the Project area has the following features:

- Turbidity: varying, in the range of 148 - 176 NTU.
- Suspended solids (SS): varying, in the range of 97 - 186 mg/L.
- Total oil content of the samples ranged from 0.001 mg/L; oil content was not found in several sampling points.
- The COD ranged from 15 to 17 mg/L, quite high in comparison with the Vietnamese standards.
- Other major heavy metals (Fe, Zn, Cu, Cd, pb, Hg, As, Mn) content was within the permissible limit in QCVN 10:2008/BTNMT (National technical regulation for coastal water quality).

Air Pollution

Environment criteria on air pollution in Vietnam are regulated in 05/2009/BTMT, which was revised on October 23, 2013 and embedded in QCVN05/2013/BTNMT. PM 2.5 criteria were newly added, namely, 50 $\mu g/m^3$ per day on average, and 25 $\mu g/m^3$ per year on average. (In Japan, average per day is 35 $\mu g/m^3$ and average per year is 15 $\mu g/m^3$), regulation on NO2 became stricter and TSP also applied stricter standard from 140 $\mu g/m^3$ to 100 $\mu g/m^3$. It is essential for coal stock yard monitoring to monitor PM 2.5 and TSP in the Project.

Table 18.7.3 Air Pollution Standard in Vietnam

unit: $\mu g/m^3$

No.	Items	Average per hour	Average per 8 hours	Average per 24 hours	Annual Average
1	SO_2	350	-	125	50
2	CO	30,000	10,000	5,000	-
3	NO_2	200	-	100	40
4	O_3	200	120	-	-
5	Total amount of suspended particles (TSP)	300	-	200	100
6	PM_{10} particles	-	-	150	50
	$PM_{2.5}$ particles	-	-	50	25
7	Pb	-	-	1.5	0.5
Remarks: (-) No regulations					

Utilization of the coal stock yard in the dry season shall bring some effects; therefore, observing the situation by monitoring is an important matter. From the comparison of the criteria of Vietnam and those of EU, most of the items have no disparities. Nevertheless, as for PM10, Vietnam set three times stricter level than that of EU, while 150 **$\mu g/m^3$** has been set in Vietnam and 50 **$\mu g/m^3$** in EU as average amount in 24 hours.

Noise and Vibration

The traffic volume of current roads is fairly huge as construction of the power plant is in progress. Other projects being developed in the nearby area have massive scale; thus, traffic volume will increase in the future. Urban development plan will construct a wide road with greenbelt at the centerline in a part of the city. The access road to this Project area is also used as a community road by the local residents. As for the transportation of construction materials and equipment, it is possible to utilize the multiport of power plant upon completion of the construction work. It is recommended that sea transport will be utilized as much as possible considering the impact to local traffic system.

Bottom Sediment

Bottom sediment takes an important role in monitoring water pollution. Heavy metals, pesticides, and organic matter are often absorbed by bottom sediment and then gradually dispersed into the water and cause impact on the aquatic ecosystem. To assess the current condition of sediment quality in the Project site, sediment samples have been collected at the port area and surrounding area. The test results were shown in the following table:
Presently, it is very difficult to evaluate the quality of bottom sediment because there are no specific standards in Vietnam.
However, the test result of bottom sediment samples which were collected showed that the concentration of heavy metals in the sediment in the port of Duyen Hai Power Plant Center area did not exceed the critical values (in comparison with Dutch and Australian standards) for bottom sediment quality (coastal area).
In comparison with Vietnamese regulation for concentration of heavy metal in soil for industrial land (QCVN 03:2008/BTNMT), the concentration of heavy metals did not exceed the critical values.

Table 14.7.3 Survey Results of Bottom Sediment

Unit: mg/kg

Location	pH	Fe	Zn	Cu	Cd	Pb	Hg
Upstream of Project area	8.37	16.99	4.69	5.35	0.04	5.11	0.660
Project area	8.33	20.30	6.99	5.30	0.04	7.23	1.030
Downstream of Project area	8.58	18.76	13.09	5.22	0.03	6.16	1.320
Dutch	-	-	140	36	0.8	85	-
Australian*1 (SL)	-	-	200	65	1.5	50	0.15

*1: National Assessment Guidelines for Dredging 2009
SL (Screening level): Level of a substance in the sediment below which toxic effects on organisms are not expected

In terms of environmental protection, careful attention is also needed on the maximum permissible limits of crop protection chemicals in the soil as directed in Vietnamese regulation QCVN 15:2008/BTNMT to assess the level of concentration of crop protection chemicals in soil.
According to the EIA for the power plant center, the pollution of organic chemicals such as herbicide and insecticide was found in the survey of bottom sediment. These chemicals derived from agricultural activities along the coast, with rainfall and rivers flowing to the sea, gradually accumulated in the bottom sediment. These pollutants not only affect the environment but also affect the groundwater quality, aquatic organisms and result in harm to human health. Consideration shall be provided in the implementation of the Project.

Biodiversity	1) Variety of plants includes 115 species in 45 categories in Duyên Hải area . Since the turbidity is high, no marine ecology was observed in the coastal area (shallows) of the proposed coal stock yard. Economically valuable fish species do not inhabit around the proposed water area. According to the interview with the fishermen in trawl fishing, there are nine fish species in this area and the fact was confirmed by fishing survey and by visiting local markets. According to the result of investigation by the divers in the proposed jetty area, the water depth was 12.5 m with sand and clay and no marine ecology was found. 2) Mangrove Many mangrove forests are commonly seen in southern Vietnam, watershed in the Mekong River, and around the proposed Project area. Some species are endangered and listed in the Redbook 2007 in Vietnam for protection. The field survey confirmed that the mangroves that inhabit in the Project area were not rare species. Rich mangrove forests grow on the coastal area wherein a dike was constructed parallel to the coast as countermeasure against soil erosion. There are other mangrove forests planted by World Bank project, but this location is far from the proposed coal stock yard.
Hydrological Situation	Sea water near the Project area has the unique feature of the Mekong watershed. Because of the soil erosion, the water has low transparency and situation of proposed unloading jetty area is the same. Soil erosion has been observed in many places in Tra Vinh Province which is caused by high tide and strong winds. For the countermeasures, planting mangrove trees and constructing dike have been carried out. Large-scale breakwater is under construction in the power plant project, and unloading jetty and facilities are planned inside of this breakwater. Therefore, no environmental impact on the hydrological situation is expected during the operation stage.
Topography and Geographical Features	Large-scale soil erosion was found in the coastal line around the Project area. According to the interview with the local residents, this erosion started in 2009 when huge volume of soil was excavated for reclamation for the construction of the thermal power plant. As a result of erosion, natural conditions and people's livelihood have drastically changed. Accordingly, it is difficult to continue farming, and many of the local residents wish to move to another place (result of interview with the local residents). For the construction of coal stock yard, careful consideration on land reclamation is necessary. There is some risk of sedimentation and erosion along the coastal line as a result of high tide and strong wind. It is necessary to carefully consider these issues during the design or planning stage of the Project.

18.8. Evaluation of Environmental Impact

The result of the environmental impact according to the survey is shown in Table 18.8.1

Table18.8.1 Evaluation of Environmental Impacts

No.	Impact factors	Impact Evaluation at Scoping		Evaluation based on the Survey Results		Reasons of Evaluation
		Before and during	After implementati	Before and during	During operation	
1	Involuntary resettlement	-B	D	-B	D	（Before construction） Proposed coal unloading jetty will be constructed inside of breakwater and power plant port which is now under construction. Involuntary resettlement would not occur in the area of power plant which is a part of the coal stock yard. Resettlement for the power plant project was completed three years ago. However, about 20 households will be required to resettle who live in newly acquired area in the project (3rd Phase: 72 ha). The residents who are engaged in farming have obtained a right of land use from the government for long time.
2	Local economies, such as employment and livelihood	+B	+B	+B	+B	(During construction) New job creation is expected for construction. (During operation） As this project is a large-scale development and will create job opportunity for the local residents, the project will result in overall socio-economic improvement of the people living around the Project area.
3	Land use and utilization of local resources	-B	D	B	D	（Before construction）(During construction) A coal unloading jetty for the imported coal will be constructed inside the power plant port, and stock yard will be planned beside the existing power plant. A part of the stock yard is located within a power plant area (ash yard) where land acquisition was completed. Additional area needed for the stock yard (22 ha: 1st Phase) is currently utilized by the local residents for agriculture or aquaculture. 1) Fishermen who conduct fishing operation at the sea: Their fishing ground is far from the proposed Project area and they have less impact. 2) Fishermen who conduct fishing in the coastal area beside the Project site: They need to change the location of fishing ground. 3) Fishermen who use fish ponds: Fish pond located in the Proposed project area will be backfilled and these fishermen are anticipated to receive impact.
4	Social institutions such as social infrastructure and local decision-making institutions	D	D	N/A	N/A	(During construction) No residents live in the proposed Project area during the construction stage; only a limited environmental impact would occur.
5	Existing social infrastructures and services	-B	D	-B	D	(During construction) Increase of construction vehicles will be encountered; there will be environmental load in terms of air pollution, noise or vibration. No one lives in the proposed Project area. However, careful attention to the local traffic system shall be paid. (During operation） Imported coal would be transported by sea transport using vessels, and limited impact on the local traffic system is anticipated.

6	Poor, indigenous, or ethnic people	D	D	N/A	N/A	(During construction) Residents who need resettlement are all from Khin Tribe. In the surrounding area, there are no residents categorized as poor, indigenous people, or ethnic minority.
7	Misdistribution of benefits and damages	D	D	N/A	N/A	(During construction) Since land acquisition and resettlement of the residents were completed under the power plant project, no misdistribution of benefits and damages is expected. As for the newly acquired land for coal stock yard, no impact is anticipated if project is carried out according to the Vietnamese laws and regulations as in the previous power plant project.
8	Cultural heritage	D	D	N/A	N/A	The Project area is on the coast, and no historic ruins or cultural heritages are observed. No impact on the environment is anticipated.
9	Gender	D	D	N/A	N/A	No negative impact on gender is anticipated by this Project.
10	Children's rights	D	D	N/A	N/A	No negative impact on children's rights is anticipated by this Project.
11	Local conflicts of interest	D	D	N/A	N/A	(During construction) Since land acquisition and resettlement of the residents were completed under the power plant project, no misdistribution of benefits and damages is expected. As for the newly acquired land for coal stock yard, no impact is anticipated if project is carried out according to the Vietnamese laws and regulations as before.
12	Water usage or water rights and communal rights	-B	C	-B	D	（Before construction) (During construction) Fishermen live in the proposed coal stock yard and they have been conducting fishing operation by small boat in the coastal area. However, they have no water right. There are fishermen who utilize the existing river as fish pond for aquaculture. It is necessary to provide adequate compensation for them.
13	Public health	C	D	D	D	(During construction) (During operation) Limited impact on public health is anticipated in this Project. Generated solid waste in the workers' camp during construction stage will increase, but it is possible that disposal will be managed with proper waste management system.
14	Hazards (risk) of infectious diseases such as HIV/AIDS	-B	D	-B	D	(During construction) Many workers will be mobilized as labor for the construction from other regions and worker's camp will be constructed for this Project. Occurrence of infectious diseases is therefore anticipated. As countermeasure, training for infectious disease prevention to all workers is recommended.
15	Topography and geographical features	-B	C	-B	D	(During construction) (During operation) There might be a possibility of change in the geographical features if large-scale land reclamation is carried out in the coastal area. It is necessary to consider this during the design stage.
16	Soil erosion	C	C	D	D	(During construction) Soil erosion is observed in the Mekong River and its branches, and water transparency is very low in these rivers. Because of the soil erosion, water turbidity in the Project area is high as well. There is no impact on planned port facility since it is constructed inside of the existing breakwater. (During operation) There might be possibility of soil erosion in the coastal line by the flow regime of silt from neighboring rivers, high tide and strong wind but there is no impact by the Project itself.
17	Groundwater	C	C	D	D	(During construction) A large amount of groundwater is not planned in this Project.
18	Hydrological situation	-B	C	-B	D	(During construction) There are medium- and small-scale rivers in the proposed Project area, which are branches of the Mekong River, and some of them are under construction for repairs by the Vietnamese army. In the north of the Project area, fishermen conducting aquaculture utilize existing rivers and ponds. As for the coal stock yard constructed within the power plant area, this would not cause any effects.

19	Coastal zone	C	C	D	D	(During construction) (During operation) The coastal area, which is being planned as coal stock yard, is a shallow sea. Mangroves have been planted in the south at the existing power plant along the coastline to prevent soil erosion. The seawater quality in the seashore in the Project area has high turbidity as it's a unique Mekong River watershed feature. Seashore has been eroded partially because large volumes of soils have been moved by the land reclamation for the power plant project. The construction of the Project plans to utilize sands from rivers for land reclamations, so there is no impact on coastal area.
20	Flora, fauna and biodiversity	C	D	-B	D	(During construction) No preserved zone or conservation area for biodiversity is regulated by international treaties or national laws in the proposed Project area. The turbidity of the coastal area (shallows) is high and no marine ecology was observed in the proposed coal stock yard. In the Project area, there is no endangered species (IUCN) to be protected. In and around the Mekong River, since some of the plants are listed in the Vietnamese Red Data Book 2007, detailed survey should be conducted. Many mangrove forests seen on the coastline of Duyên Hải District were planted in order to prevent soil erosion of seashore.
21	Meteorology	C	C	-B	-B	(During construction) In the construction of the coal stock yard, special attention to the conditions of meteorology is needed during the rainy season, where heavy rain hinders civil works substantially. (During operation) In the dry season, strong wind is a risk to scatter coal dusts which will cause air pollution. For safety purpose, it is necessary to suspend operation in the field under the conditions of strong wind. (Example of Japanese experience: more than 16 m/s of wind speed)
22	Landscape	D	D	N/A	N/A	(During construction) (During operation) The proposed Project area is not designated as a national park or preservation area. The height of the coal stock yard is estimated to be as high as 15.5 m, and it would form a special appearance but it is on a distant location and it is located beside the existing power plant; as a result, the landscape would be harmonious to some extent.
23	Global warming	D	C	D	D	(During construction) (During operation) Increased supply of coals to the power plant would affect global warming, but limited impact would be projected by this Project exclusively.
24	Air pollution	C	-B	D	-B	(During operation) Massive amount of coal will be imported from Indonesia or Australia every month. The unloaded coal would be stored at the stock yard and delivered to each power plant using small vessels (5,000 t). In the dry season, fine particles of coal may cause air pollution, so the following countermeasures are planned: 1) Dust prevention fence 2) Dust prevention roof of belt conveyors 3) To reserve buffer zone around the Project area and tree planting It is necessary to monitor the air quality continuously for checking and confirmation of environmental conditions.

25	Water pollution	-B	C	-B	-B	(During construction) Construction work includes dredging in the port and access channels, and soil and earth of the seabed will be disturbed as a result. If necessary, silt fence will be used as countermeasure against water pollution. In this Project, about 36 million m^3 of dredging work is expected. However, due to muddy conditions of the seawater, the water has low transparency and very low visibility. It is expected that impact of water pollution by dredging work is limited. Impact might be reduced by studying the dredging method and monitoring. Disposal site for dredged soil need to be approved by the related authority in advance. (During operation) Coal particle collecting system such as a settling basin is planned to prevent discharge of coal to sea with surface drainage which includes small particles of coal. The collected coal will be reused as fuel. As for the wastewater discharged from the facility, it is treated before discharge, so the impact should be small. In case maintenance dredging is needed, criteria described above shall be referred to.
26	Soil contamination	-B	C	-B	D	(During construction) In case of necessary land reclamation, soil contamination is anticipated to give some impacts. It is necessary to treat spill water properly to lessen the impact. Spill water from the reclamation ground shall be drained well enough during construction.
27	Waste	-B	C	-B	D	(During construction) Garbage from the construction workers' camp and solid waste generated from the construction are anticipated. However, amount of hazardous waste would be limited. (During operation) In case there is no treatment facility for oil and waste in the port, bilge generated from vessels will be treated at the maintenance dock.
28	Noise and vibrations	C	C	D	D	(During construction) (During operation) Source of noise anticipated is the construction machineries, but location of construction site is very far from residential area and this impact is negligible. Most of the machinery and construction materials will be carried by sea transport, but in some cases, transport will be by land transport and this might possibility cause noise and vibration impact. Nevertheless, this will occur in limited circumstances, and the impact is supposed to be small.
29	Ground subsidence	C	C	D	D	(Before /During construction) In the land reclamation work, proper method and countermeasures against ground subsidence are provided.
30	Offensive odors	C	C	D	D	(During construction) No odor source is anticipated in the construction work and there is no notable source of offensive odors. There might be a possibility of impact caused by the existing thermal power plant.
31	Bottom sediment	C	C	D	D	(During operation) Coal dusts in the stock yard would be washed away by rain during the rainy season, and surface water will include particles that will flow into the collection system such as settling basin, so the impact is less. Washed coals will be removed and only rain water will be discharged to the sea. The collected coal can be reused.
32	Accidents	C	C	-B	D	(During construction) For the construction of the coal stock yard and unloading jetty, most of the machinery and construction materials will be carried by sea transport, but in some cases, transport will be by land transport and this might increase the number of traffic. The access road was used by local residents and this might possibly cause impact on the traffic safety. Transport of equipment and materials has limited conditions, but it is necessary to provide training for the safety of workers during the construction stage.

18.9. Mitigation Measures and Cost

The environmental mitigation plan is indicated in the following Table 18.9.1.

Table 18.9.1 Environmental Mitigation Plan

No.	Impacts	Mitigation Measures	Implementing Institutions	Organization to be Responsible	Cost (USD)
	(During construction)				
1	Involuntary resettlement	1) To conduct resettlement based on approved RAP. 2) To conduct monitoring in order to execute resettlement as planned.	Established Resettlement Committee	Established Resettlement Committee	5,000
2	Land use and utilization of local resources	1) To compensate properly after the confirmation of actual fishing activities in advance. 2) To confirm there is no fishermen who get disadvantaged in fishing by monitoring.	Established Resettlement Committee	Established Resettlement Committee	5,000
3	Right of water use	1) To confirm there is no fishermen who get disadvantaged in fishing operation by monitoring.	Established Resettlement Committee	Established Resettlement Committee	4,000
4	Infectious diseases such as HIV/AIDS	1) To provide education for construction workers about infectious diseases regularly. 2) To prepare pamphlet and sign boards on enlightenment activity.	Contractor	VCM	3,900
5	Lake, river	1) To conduct survey of the existing lakes and rivers during the design stage and discuss with relevant organizations.	Consultant	VCM	12,000
6	Accidents	1) To train construction workers about safety and sanitation regularly. 2) To raise awareness on traffic safety to drivers through educational training. 3) To prepare a notice board at the construction site for enlightening on safety first and highest priority, and fix necessary facilities and inspect it regularly 4) To supply safety equipment for projection such as helmet and gloves to workers.	Contractor	VCM	5,800
7	Water pollution	1) To conduct water quality monitoring in dredging work and set up a silt fence if needed. 2) To carry out monitoring of discharged water with appropriate countermeasures against spill water in landfill work. 3) To install temporary lavatory at construction site properly. 4) To conduct regular environmental monitoring on surface water, groundwater, and discharged water.	Contractor	VCM	30,000
8	Waste	1) To carry out solid waste management properly by promoting 3R. 2) To manage hazardous waste (oil and chemicals) and consign it to the specialized company for collection and treatment. 3) To install waste bins properly at areas in the workers' camp and construction site. 4) To conduct regular monitoring of wastes.	Contractor	VCM	4,100
9	Bottom sediment	1) To carry out monitoring at the disposal site of dredged soil. 2) To install silt fence at disposal site if needed.	Contractor	VCM	3,800
10	Meteorological phenomenon	1) To set up sufficient schedule for civil works in the rainy season as countermeasure. 2) To construct major component of civil works in the dry season.	Contractor	VCM	-
11	Biodiversity	1) To reduce impact of water pollution on the ecology by countermeasures. 2) To conduct field survey on plants listed in the Redbook of Vietnam before starting construction.	Contractor	VCM	17,000
12	Hydrological Situation	1) To carry out monitoring of soil erosion on the floating condition of silt in neighboring rivers, and sedimentation caused by high tide and strong wind in the seashore.	Contractor	VCM	8,000
	(During operation)				

1	Accidents	1) To carry out safety training to the construction workers regularly. 2) To carry out traffic safety training to the drivers. 3) To prepare traffic signboards based on the traffic rules, to dispatch traffic control staff properly, and to construct temporary roads for safety operation. 4) To prepare signboards to advocate safety first as the highest priority in the construction site. 5) Training about international laws of vessels (MARPOL)	Operator, Transportation Company	-	-
2	Air pollution	1) To confirm functions of equipment and system by monitoring. 2) To conduct regular monitoring of coal particles scattered from the coal stock yard in the dry season during operation. 3) To plant trees around the coal stock yard and to set up a buffer zone to promote greening.	Operator	-	-
3	Water pollution	1) To conduct water quality monitoring in maintenance dredging applying silt fence if necessary. 2) Washed coals in surface water shall be collected by settling basin and reused. 3) To conduct regular environmental monitoring of surface water, groundwater, and discharged water.	Operator	-	-
4	Waste	1) To carry out solid waste management properly by promoting 3R. 2) To manage hazardous waste (oil and chemicals) and consign it to the specialized company for collection and treatment. 3) To properly dispose solid waste generated in the coal terminal. 4) To conduct regular monitoring of generated wastes.	Operator	-	-
5	Bottom sediment	1) To carry out monitoring at the disposal site of dredged soil. 2) To install silt fence at disposal site if needed.	Operator	-	-
6	Meteorological phenomenon	1) To cease operation during high waves and high wind speed. 2) To prepare operation manual for operation of coal stock yard and unloaders.	Operator	-	-
7	Biodiversity	1) To reduce impact of water pollution on the ecology by countermeasures.	Operator	-	-
8	Hydrological situation	1) To carry out monitoring of soil erosion in neighboring rivers and sedimentation caused by high tide and strong wind in the seashore.	Operator	-	-

18.10. Monitoring Plan

Unexpected problem may possibly appear during the planning and operation stages. Monitoring plan aims to provide detailed monitoring program which covers the whole project and to prepare for the problems timely when they happen. It is important to monitor and record the environmental change continuously since unforeseeable matters could happen in this large-scale development project. Necessary monitoring plans for the Project implementation are shown in Table 18.10.1 and Table 18.10.2.

Table 18.10.1 Monitoring Criteria During Construction

Classification of Monitoring /Sampling Points	Items	Frequency		
		Baseline Data	During Construction	During Operation
Water quality in the dredging and disposal site	Turbidity (NTU)	Once during dry season, and once during rainy season	Every working day during construction	-

Water quality in the reclamation site	Turbidity (NTU)	Once during dry season, and once during rainy season	Every working day during construction	One time per year
Soil erosion in the reclaimed site	Including monitoring on reclamation and leveling of ground, and mitigation plans on work process and technology	-	Every working day during construction	-
Bottom sediment in the access routes inside the breakwater and at the unloading jetty	pH	Once before the dredging work	Once during dredging work	One time per year
	T-S			
	T-N			
	T-P			
	T-Hg			
	Cd			
	CN			
	Cr			
	Cr+6			
	Pb			
	As			
	PCB			
	Cu			
	Zn			
Water quality in the access routes inside the breakwater and at the unloading jetty	Water temperature	Once during dry season, and once during rainy season	Once during dry season, and once during rainy season	Once during dry season, and once during rainy season
	Salinity			
	Turbidity			
	TSS, mg/L			
	pH			
	DO			
	BOD5			
	COD			
	T-N			
	Oil and grease			
	Coliform, MPN/100 mL,			
Air quality at the coal stock yard and its surrounding area	Particulate matter Aerodynamic diameter, PM10 Size < 10 µm in size	Once before start of construction work	Once during dry season, and once during rainy season	Once every month during dry season
	Particulate matter Aerodynamic diameter, PM2.5 Size < 2.5 µm			
	NO2			
	SO2			
	CO			
Air quality at construction site and reclamation site	Visual inspection	-	Every day	-
Waste from construction site and dumping site	Amount of garbage collected at the site	-	Every day	Every month
	Collecting and dumping situation	-	Every day	-
Compliance with health management and safety of construction workers	To be confirmed	-	Every day	-
Noise and vibration	Construction machineries and vehicles	-	Every day	Every month
Traffic congestion	Traffic volume counted by categories on the access road to the stock yard during peak time	Once before construction starts	Every day	Every month

Table 18.10.2 Monitoring Criteria and Collection Location

Classification of Monitoring	Location	Necessity			Remarks
		Baseline	During Construction	During Operation	
Water quality at dredging and dumping site	Turbidity: -Dredging /sediment dumping site- Three points (100 m, 500 m, 1000 m from construction site, three levels) -Near the coast	√	√	√	Three levels: -1 m below the surface of the water, middle layer of the water, 1 m above the sea bottom -Monitoring will be conducted near the downstream
Reclamation	Reclamation site	√	√	-	
Seabed soil	Breakwater, access channel, jetty	√		√	
Land erosion	Construction site, coast area	√	√	-	
Seawater quality	Inside the breakwater, sea route, and coal loading pier	√	√	√	
Atmosphere 1	Near the coal stock yard, near residential area where the operation of yard will have effect	√	-	√	
Atmosphere 2	Construction site, reclamation site	√	√	-	Construction machineries/vehicles: visual inspection
Waste accumulated at the construction site	To be confirmed by the contractors, dumping site allotted to the contractors and other sites where the waste could be brought in	√	√	√	
Accidents at the construction site	Every site under contract	√	√	√	
Noise and vibration	Every site under contract	-	√	√	Construction machineries/vehicle, near the residential area where the impact could be experienced
Traffic/ public properties	Access road to port and coal stock yard, bypass roads, and other temporary roads set up for the construction. Water traffic by vessels: inside breakwater and access channel	√	√	√	Land area, sea area

Explanatory Note:

√ : Proposed monitoring

18.11. Necessity of Land Acquisition and Resettlement

In the scope of the study, the most appropriate project site is determined by considering several conditions among the alternatives. The Project site which is under consideration is indicated in Figure 18.11.1. The Project site for the coal stock yard needs 72 ha (1st Phase: 22 ha, 2nd Phase: 40 ha, 3rd Phase: 72 ha) at most and 22 ha is needed during the first construction stage. The most appropriate site is selected based on the conditions of the proposed sites and affected area. The current conditions of five proposed sites from A to E are summarized in the following Table 18.11.1.

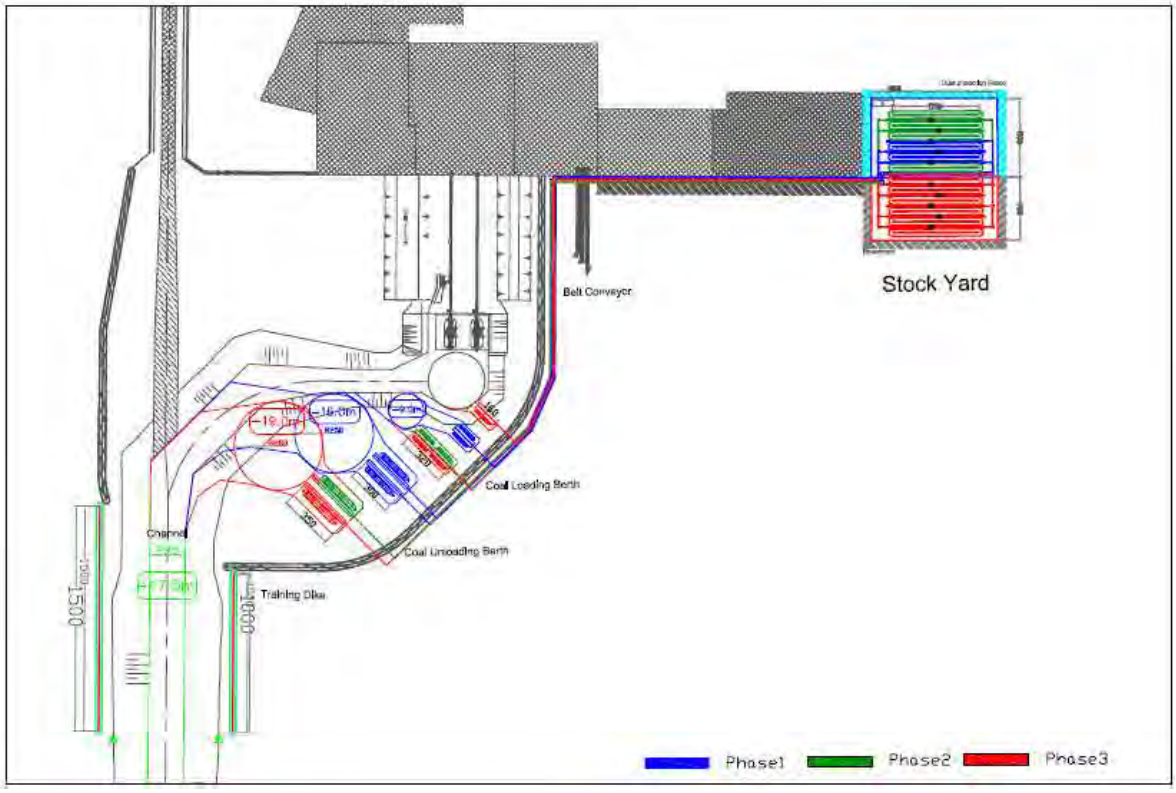


Figure 18.11.1 Proposed Project Sites

Table 18.11.1 Existing Conditions and Impact of Proposed Site for Coal Stock Yard

（In case of 72 ha)

Proposed Site		Existing Condition	No. of Affected Households	Summary
a	West side and southwest side of coal power station/ west side of Quan Chanh Canal	Dan Thanh Commune, residential area in Mu U District and Con Cu District	Approximately 80 households	Existing land use is mostly fishpond for aquaculture, Approximately 80 households reside in the area.
b	West side of coal power station/neighboring area	Dan Thanh Commune, residential area in Giong Gieng District	Approximately 80 households	There are approximately 80 households, including small shops and small-scale factories, along the 1 km street fronting the power plant.
c	Northeast side of coal power station （inland）	Truong Long Hoa Commune, residential area in Con Trung District	Approximately 20 households	There are approximately 20 households, fish ponds and agricultural lands.
d	Northeast side of coal power station （Ocean side）	Truong Long Hoa Commune, Lang Chao Hamlet District and Con Trung Hamlet District	0	There are no residents because of ocean area.
e	Southwest side of coal power station (sea side)	Dan Thanh Commune, ocean side of dike	0	There are many mangroves planted for prevention of soil erosion. Also, there are fish ponds and watch house with no permanent residents.

Among the five proposed sites above, the site with least effect regarding resettlement and land acquisition is Case C. The selection of the site was determined considering the conditions below and Case C was selected as the most appropriate site for the Project.

- Distance from jetty
- Access to power plant
- Possibility of expansion
- Compensation to affected local residents
- Construction cost
- Environmental impact（Details are shown in Section 5.2.3）

18.12. Legal Framework for Land Acquisition and Resettlement

Legal framework for land acquisition, compensation, and resettlement is based on the Land Law, Decree No. 69/2009 and relevant regulations. Major relevant laws are listed in Table 18.12.1.

Table 18.12.1 List of Legal Framework for Land Acquisition and Resettlement

No.	Laws	Summary
1	The Land Law No. 13/2003/QH13, which was approved on 29 November 2013 and effective on 1 July 2014	It provides Vietnam with a comprehensive land administration law.
2	Decree No.181/2004/ND-CP (Approved on 29 October 2004)	It relates to the implementation of the Land Law 2003. Following the approval of the New Land Law 2013, the government will issue a decree for implementing the New Land Law and replacing the Decree No.181/2004/ND-CP.
3	Decree No.188/2004/ND-CP (16 November 2004) and Decree No.123/2007/ND-CP	Decree No.188/2004/ND-CP specifies methods for land pricing and issuance of land price framework for land categories. Decree No.123/2007/ND-CP provides guidelines for implementation of Decree No. 188/2004/CP.
4	Decree No.123/2007/ND-CP (2007)	It gives provincial people's committees the authority to set local land prices by establishing ranges for all categories of land.
5	Decree No. 197/2004/ND-CP (3 December 2004)	It relates to the compensation, assistance and resettlement when land is recovered by the state.
6	Decree No. 69/2009/ND-CP (2009)	It relates to the supplementary regulations on land use planning, land prices, land acquisition, compensation, support and resettlement.
7	Decree No. 88/2009/ND-CP (19 October 2009)	It relates to the grant of certificates of land use rights and house and land-attached asset ownership.
8	Decree No. 84/2007/ND-CP (2007)	It relates to the supplementary stipulations on the issue of land use rights certificates (LURC), land acquisition, land use right implementation, procedure of compensation, and assistance in the event of land recovery by the state, and grievance redress.
9	Decree No. 38/2013/ND-CP (23 April 2013)	It relates to the management and use of official development assistance (ODA) and concessional loans of donors.

18.12.1. Land Acquisition

(1) Laws on Land Acquisition

The EIA report for the Project has not been prepared yet. It is required to prepare the report including land acquisition, resettlement, and compensation based on Vietnam's EIA regulations. The authority in charge for land acquisition, resettlement, and compensation shall be appointed in the people's committee under the ministry based on relevant laws and the compensation committee will conduct the necessary activities on land acquisition,

(2) Compensation Policy and Eligibility (Decree 197 Article 8)

Decree 197 Article 8 regulates the compensation policy and the eligibility of compensation in case assets are lost or damaged by the Project.

In the case the land is acquired by the government, person who meets eligibility can get compensation and household, individual person, and organizations which possess the community and land are admitted as eligible body.

(3) Range of Compensation (Decree 197 Article 5)

Under the new land law, the following four categories are compensated in the case of land acquisition by the government:

i) Land acquired by the project;
ii) Expenses invested to the land and buildings which are located in the land acquired by the project;
iii) Living recovery by resettlement, job training, and other supports; and
iv) Support for living recovery and payment after resettlement;

Decree 197 sets regulations for ineligible cases under Decree 197 Article 1 Section 3, which mentions that buildings and lands that the government possesses are ineligible for compensation.

(4) Payment of Compensation（Decree 197 Article 10）

The person whose land is acquired is compensated with new land. In case land is unavailable, he shall be compensated by cash which is the same value as that of the acquired land at the time the determination of land acquisition was issued. Also, in case of compensation of new land and housing, the amount of difference if any shall be paid by cash. In case the land for which the owner is not eligible for payment is acquired, the amount of payment is deducted from the compensation.

18.12.2. Resettlement Plan

The laws and regulations regarding resettlement plan are summarized as follows:

(1) Resettlement Plan (Circular 116 Part VI）

Resettlement Plan consists of the following two parts:

Part I Determination of compensation for land acquisition and level of compensation

Resettlement plan, land value for land use tax, land sales value, house rent at resettlement site

Part II Amount of payment for obligatory duty related to land by person acquired
Amount of payment for land usage and purchase housing at resettlement site

(2) Disclosure of Information for Resettlement Plan (Decree 197 Article 34)

As for information disclosure, organizations appointed by the people's committee at the provincial level need to inform the draft resettlement plan to affected households and provide notice on the committee's board 20 days before the resettlement plan is approved by the authority.

Also, since resettlement at the site is given priority, households which conducted land readjustment, located in good site before resettlement, and receive social security are prioritized to be located in good resettlement site.

(3) Calculation of Right of Land Use (Decree188/2004/ND-CP and Cirucular114/2004/TT-BTC)

Calculation of land use tax and amount of compensation for land acquisition is conducted by localities based on land price which is calculated by people's committee in accordance with Decree188/2004/ND-CP and Cirucular114/2004/TT-BTC. The calculation method of land price is carried out in two ways, namely, direct comparison and income base, as follows:

-Direct comparison: Comparing categories, area, land position, class of land, urban center grade, with land value at market; Land position and land price of categories are determined.
-Income base: Land value is calculated using index of average saving interest in Vietnamese dong of the National Bank.

(4) Living Assistance at the Resettlement Site (Decree 197 Article 36 Circular 1, 2)

People's committee in the province determines the level of living assistance at the resettlement site in accordance with the local situation. The assistance menus are as follows:

-Assistance for agricultural seeds for the first year, domestic animal, service for agricultural promotion, service for forest industry's promotion, and plant quarantine
-Assistance for creation of employment at resettlement site, especially for women

18.13. Extent of Resettlement and Land Acquisition

The impact on resettlement by each proposed plan is estimated in the following Table 18.13.1. The recommended plan in the Feasibility Study is Plan C and the number of households for resettlement is estimated as 20 households in the 3rd Phase.

Table 18.13.1 Estimated Impact by Each Proposed Site

Area for Stock Yard	Plan A	Plan B	Plan C	Plan D	Plan E
72 ha 3rd Phase	80	80	20	0	10 *1
40 ha 2nd Phase	30	30	20	0	5 *1
22 ha 1st Phase	15	15	10	0	0

* 1 : Residents who reside in the watch house (not permanent residents)

18.14. Comparison between JICA Guidelines and Vietnam's Law

The following Table 18.14.1 provides a comparison between the JICA Guidelines and Vietnam's law.

Table 18.14.1 Comparison between JICA Guidelines and Vietnam's Law

No.	JICA Guidelines	Vietnam Law
1	**<Eligibility>** The eligibility is clearly distinguished and it includes the following: a) Those who have formal legal rights to land. b) Those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets; (provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan). c) Those who have no recognizable legal right or claim to the land which they are occupying.	The New Land Law, Article 75: The land users satisfy the following conditions: a) Those who have certificate of land use or ownership of non-land assets. b) Those who do not have a certificate of land use or equivalent documents, but eligible to have certificates. The New Land Law, Article 77: For agricultural land use before 1 July 2004 land users who are directly involved in agricultural production, but have no certificate or eligible for a certificate land use rights and ownership of houses and other assets attached to land under the provisions of this Article shall be compensated for the actual land area used, the area of compensation shall not exceed the credit limit for agricultural land specified in Article 129 of this Law. c) Those who are not eligible for compensation will be considered to be supported by the Provincial People's Committee (New Land Law, Article 83)
2	**<Compensation at Replacement Cost>** It indicates compensation at replacement cost for losses of assets. It clearly indicates the following: a) Calculation method of the replacement cost for agricultural land and land in urban area. b) Management of cost of any registration and transfer taxes. c) In repairing structures, necessary costs such as transport cost of building materials and labor cost should be covered. d) Interest in the case of delays in actual payment of compensation.	Compensation for land: Clause 2, Article 74, the New Land Law provides the principle of compensation: Compensation for land is basically provided by alternative land with the same land use. In case alternative land is not available, compensation equal to the value of land use rights, which is calculated based on land prices at the time of land recovery decision, will be paid. Current regulation (Decree No. 69) - Article 11: When land price for compensation stipulated in a provincial decision is not close to the market price, the Provincial People's Committee shall re-examine appropriate land price. No registration and transfer taxes are required for relocating households to the allocated plot of land in the resettlement sites. Compensation for houses/ structures: Clause 1, Article 89, the New Land Law: For houses, structures affected shall be compensated by

No.	JICA Guidelines	Vietnam Law
		the value of new houses/structures with similar technical standards. Article 91, the New Land Law regulates the relocation support, including allowance for building material transport. Compensation for crops/trees: Article 90 provides guidelines for compensation of annual crops, perennial trees, and aqua-breeding ensuring adequate compensation. Delay in actual payment of compensation: If compensation payment is delayed, and the delay is caused by the state's agencies, the amount should be paid with interest rate (Article 93).
	<Compensation and Assistance (Livelihood Restoration, Resettlement and Community)>	
3	Compensation modes for lost assets are clearly prescribed: land-based resettlement strategies or cash compensation, or both	Clause 2, Article 74, the New Land Law provides the principle of compensation: Compensation for land is basically provided by alternative land with the same land use. In case alternative land is not available, compensation is paid in cash.
4	Necessary assistance for livelihood recovery is required such as short-term employment, livelihood assistance, and income compensation.	The New Land Law, Article 82 numerates the support provided to the affected people as follows: - Support for life and production stabilization; - Support for job-change training and job creation are provided in case of agricultural land acquisition; - Resettlement allowance; and - Other support. The government shall issue detailed regulations. Article 17. Decree No. 69: Assistance for land acquired by the government comprise: 1. Relocation assistance and resettlement assistance in case of acquiring residential land; 2. Assistance to stabilize life and production, training for career change and vocational training, in case of acquiring agricultural land; 3. Assistance upon acquiring agricultural land located in the residential area; garden land and pond land which are not certified as residential land; and 4. Other assistance. Articles 18-23 of Decree No. 69 give guidelines to identify eligible people and levels for different types of assistance.
5	Relocation assistance such as relocation allowance is addressed and requested explicitly.	Resettlement allowance is addressed in the New Land Law, Article 82. In the Decree No. 69, detailed criteria for providing relocation assistance and resettlement assistance are as follows: Article 18. Relocation Assistance: Household, individual who have to be relocated shall be assisted with relocation cost, including transport allowance, house renting… Article 19. Resettlement Assistance: Relocated people having no other accommodation will be allocated with land or house at the resettlement sites. If the relocated houses are not currently used as accommodation or the relocating households have

No.	JICA Guidelines	Vietnam Law
		other houses and are living there, they will be not entitled to resettlement assistance.
6	Enhancement of infrastructure in the resettlement site such as roads, water supply, drainage and sewerage; waste management; and public service such as education and health, and provision and assistances of alternative or similar resources to compensate loss of access to the community resources such as fisheries, rangelands, fuels, feeds, farms, and irrigation water, are required.	Land is acquired only after resettlement site is ready (Article 85, New Land Law). It is mentioned that the resettlement areas must have the infrastructure to ensure that planning and construction standards are in accordance with the natural and social conditions of individual regions.
7	**<Participation of PAPs >** Appropriate participation of affected persons and their communities are facilitated in planning, implementation, and monitoring measures on involuntary resettlement and loss of livelihood.	There is no clear description about public participation in planning and implementation of resettlement plan. However, there is a principle to ensure "democracy" in the New Land Law. Clause 2, Article 73 emphasized that "the compensation, support, and resettlement be provided when the State acquires land to ensure democracy, objectivity, fairness, openness, and compliance with the law." <u>Planning phase:</u> Participation of affected people is mentioned through the Land Law: (i) Public meetings on announcement of land acquisition (Article 69); (ii) Public meetings on the draft plan of compensation, support, and resettlement (Article 69); (iii) Meetings to discuss the plan of job changing/creation with affected people (Clause 3, Article 84); and (iii) Publicly posting the information of resettlement sites and allocation land plots in the resettlement sites (Article 86). According to Decree 69/2009 (Article 25), representatives of affected people and mass organizations, such as women union and farmer union, are members of the District Compensation Committees. The committees operate until all compensation, support, and resettlement are completed.
8	**<Grievance Redress Mechanism>** Appropriate and accessible grievance redress mechanism is required.	The New Land Law, Article 204: Land users and people who have rights and obligation related to the land use have the right to complain on the decisions related to land administration. A four-stage procedure for redress of grievances is regulated in Vietnam.

No.	JICA Guidelines	Vietnam Law
9	**<Consultation with PAPs>** Discussion with PAPs to be relocated and host communities in resettlement site, and strategies for participation of communities in preparation and implementation of resettlement activity are required. As steps of the participation, whether or not (1) information disclosure, (2) public consultation, and (3) public participation are carried out properly in the planning and implementation stages.	The New Land Law, Article 69 provides detailed criteria of consultation with PAP as follows: i) Opinions of affected people are collected during resettlement plan preparation through public meetings with affected people in the project area; and to post publicly the plan. The posting of the plan shall be recorded in minutes with confirmation of representatives from CPC, Commune Fatherland Front, and persons whose lands are acquired (Article 69); (ii) the plan of job change/creation is discussed with affected people (Article 84, Clause 3) and (iii) selection of resettlement sites and allocation land plots in the resettlement sites are discussed with relocated people (Article 86).
10	**<Considerations to Socially Vulnerable Groups>** It is required to pay special attention to socially vulnerable groups, especially those below the poverty line, landless, elderly, women, children, indigenous people, persons with disabilities, and minority group.	There is no clear description about specific support for socially vulnerable people. In Article 82, the New Land Law only mentions about other support and request to the government such as to give detailed regulations. In Decree No. 69/2009, Article 23, it is regulated that necessary support is provided by considering the local situation in addition to livelihood rehabilitation.
	<Monitoring>	
11	The design of plans, implementation structures, costs, and financial source for both internal and external monitoring during and after the resettlement are required.	Monitoring is not clearly requested. Section 1 of Chapter XIII of the New Land Law mentions the monitoring, follow-up, and evaluation on the use and management of land in general. Article 198 regulates the responsibilities of National Assembly, People's Council at different level and member of Father Front Unions; while Article 199 provides the rights for people to monitor and supervise the use and management of land, including land acquisition, support, and resettlement.
12	It is required to disclose the monitoring results to stakeholders for both internal and external monitoring during and after the resettlement.	There is no relevant description.

Note: Where the JICA Guidelines do not specify the detailed requirements, as per JICA's policy, the WB requirement is referred in the column of "JICA Guidelines".

Source: Prepared by the JICA Study Team

18.15. Public Consultation

Stakeholder consultation is important for the preparation of EIA. The purpose of the stakeholder consultation is to promote residents' understanding by providing information about the project and exchanging ideas between residents and stakeholders and implementing bodies. JICA projects require close communication with stakeholders during the construction and operation stages based on JICA's guideline.

The Project is required to conduct information disclosure, public consultation, and public participation during the planning stage and implementation stage as for stakeholder consultation.

The public consultation for the Project is planned to be organized by the people's committee based on Vietnam's law after the Project site is selected and the investment report is approved. The schedule, however, is not fixed at present. In accordance with the Law on Environmental Protection, Article 20, comments collected during the public consultation need to be reflected into the EIA. The EIA is supposed to be prepared by Vietnam's side after the investment report is officially approved by the government.

18.16. Proposal

18.16.1. Planting Trees in Buffer Zone

In implementing large-scale development projects such as construction of thermal power plant, it is obligatory to plant trees or reserve a part of the project site for tree planting area under the EIA in Vietnam. As 20 ha (1st Phase) area of coal stock yard is proposed, planting trees is also proposed in this Project. Planting trees around the stock yard is valuable for dust proofing in the dry season. Also, it will be able to hinder spraying dusts to the neighboring area after implementation of the Project. From the landscape perspective, planted trees would cover the unique stock yard's view. The kind of tree to be proposed is Casuarina tree (Casuarina equisetifolia J.R.et G. Forst.). Because this tree has strong resistance to salt, it is appropriate in the coastal area and in reclamation area where seawater is absorbed. This tree is commonly used in many projects as shelterbelt in southern Vietnam. A picture of Casuarina tree is shown in Photo 18.16.1.

Photo 18.16.1 Casuarina Tree

Appendix-A

Current Status of Project Area

	
A Existing power plants	A Power plants under construction
	
A Power plants from distant view	A Breakwater of power plants（under construction）
	
A Communities which resides in frontal road（Plan B）	A Communities which resides in frontal road（Plan B）

A: Neighboring area of power plant
B: Housings for affected households
C: resettlement area for power plant project

	
A Power plants from distant view	A Mangrove at power plant area
	
B Exisitng housings	A Planted mangroves
	
B Exisitng housings	B Exisitng housings

	
A Mangroves at distant view	A Rivers and mangroves
	
A Erosion control at seaside	A Erosion at seaside
	
C Housings for resettled fishermen	C Housings for resettled fishermen

	
C Fishing boats at resettlement area	C Schools at resettlement area
	
A Plan A at distant view	A Plan C at distant view
	
A Plan D at distant view (seashore)	A Plan E at distant view (seashore)

Appendix-B

Field Survey of Natural Conditions and Environmental Survey

B1 Bathymetry Survey

The flowchart for bathymetric survey is shown in Figure B-1 below.

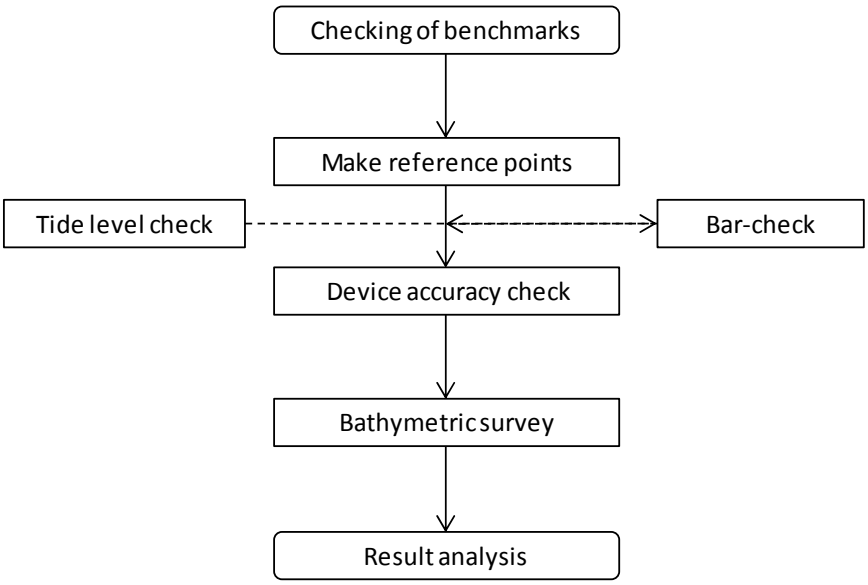


Figure B-1 Flow-chart for bathymetric survey

The Vietnamese national benchmarks No.694402 and No.693508 were used to make new reference points in survey area. The coordinates for these two points is listed in Table B-1, Table B-2. The benchmarks used for leveling survey are III (TC-LS) 11 as shown in Table B-3.

Table B-1 Benchmark Coordinates (VN2000)

Point	Coordinates		Note
	X (m)	Y (m)	
694402	1067977.609	665389.480	Central meridian 105^0, zone 6^0
693508	1057119.054	658297.472	Central meridian 105^0, zone 6^0

Table B-2 Benchmark Coordinates (WGS84)

Point	Coordinate	
	Latitude	Longitude
694402	$9^0$39'29.2037"N	$106^0$30'26.5519"E
693508	$9^0$33'36.7461"N	$106^0$26'32.4132"E

Table B-3 Benchmark for leveling

Point	Height (m)	Note	Status
III(TC-LS)11	2.039	Grade III, Hon Dau national elevation	Good

Traverse survey was carried out with above national benchmarks to make 3 new reference points in the Project area. These benchmarks were named COAL-IV-01, COAL-IV-02, COAL-IV-03,

respectively. The traverse surveying network and leveling network were shown in Figure B-2, Figure B-3. The coordinates and elevation of the reference points were shown in the Table B-4.

Figure B-2 Traverse surveying network

Figure B-3 Figure 3.1.5 Leveling network

Table B-4 Coordinates and elevation of reference points

Point	Coordinates		Elevation (m)	Remarks
	X-North (m)	Y-East (m)		
COAL-IV-1	1059279.761	612297.959	2.093	Grade IV
COAL-IV-2	1060750.995	612414.398	2.123	Grade IV
COAL-IV-3	1061154.168	613341.318	3.019	Grade IV

※VN2000

The RTK-GPS Method (Real Time Kinematic) was used for bathymetric survey. This method is a combination of GPS, sonar device, elevation antenna using with high accuracy. The principle for this measuring method was shown in Figure B-4.

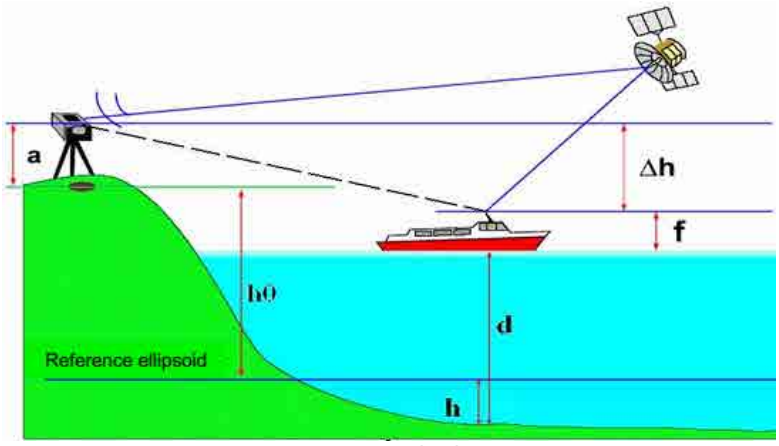


Figure B-4 RTK-GPS Method

B2 Boring Survey

The Boring samples were sealed and loaded carefully into the laboratory to examine the physical, chemical characteristics. The laboratory test results for each soil sample is also listed as follows.

Table B-5 (a) Laboratory test results

No.	TT No	Borehole	Sample No.	Depth (m)		Percent passed sieve size (mm)										Natural moisture content w (%)	Atterberg Limits				Bulk density (g/cm³)		Particle density Δ (g/cm³)	Void ratio eo	Porosity n (%)	Degree of saturation G (%)	Soil group	Description
				From	To	25	19	9.5	4.75	2.00	0.85	0.425	0.25	0.075	< 0.005		Liquid limit W_L(%)	Plastic limit Wp(%)	Plasticity index Ip (%)	Consistency (B)	Natural	Dry						
1	2	BH1	U1	2.00	2.60						100.00	99.92	99.72	98.46	37.17	56.58	45.37	24.02	21.35	1.53	1.60	1.02	2.69	1.637	62.08	92.98	CL	Brownish grey, grey, Lean clay
2	2	BH1	U2	4.00	4.60						100.00	99.96	99.86	99.48	39.02	74.52	60.50	28.63	31.87	1.44	1.56	0.89	2.70	2.034	67.04	98.92	CH	Brownish grey, grey, Fat clay
3	2	BH1	U3	6.00	6.60					100.00	99.98	99.94	99.86	99.62	51.14	57.01	64.60	32.42	32.18	0.76	1.60	1.02	2.72	1.667	62.50	93.02	MH	Brownish grey, grey, Elastic silt
4	2	BH1	U4	8.00	8.50						100.00	99.98	99.84	99.46	38.67	52.50	58.42	28.70	29.72	0.80	1.63	1.07	2.69	1.514	60.22	93.28	CH	Brownish grey, grey, Fat clay
5	2	BH1	U5	10.00	10.60						100.00	99.98	99.84	98.94	41.32	80.12	71.35	34.65	36.70	1.24	1.50	0.83	2.70	2.253	69.26	96.02	MH	Brownish grey, grey, Elastic silt
6	2	BH1	U6	12.00	12.60					100.00	99.98	99.94	99.70	97.43	38.92	60.51	62.63	30.50	32.13	0.93	1.64	1.02	2.69	1.637	62.08	99.43	CH	Brownish grey, grey, Fat clay
7	2	BH2	U1	2.00	2.50						100.00	99.98	99.92	99.74	35.27	56.75	48.32	23.84	24.48	1.34	1.59	1.01	2.69	1.663	62.45	91.80	CL	Brownish grey, grey, Lean clay
8	2	BH2	U2	4.00	4.70					100.00	99.98	99.96	99.74	99.22	38.96	65.33	60.07	25.71	34.36	1.15	1.58	0.96	2.70	1.813	64.45	97.29	CH	Brownish grey, grey, Fat clay
9	2	BH2	U3	6.00	6.70						100.00	99.98	99.90	99.34	38.74	70.43	56.56	26.78	29.78	1.47	1.57	0.92	2.69	1.924	65.80	98.47	CH	Brownish grey, grey, Fat clay
10	2	BH2	U4	8.00	8.70						100.00	99.98	99.84	99.18	43.85	59.63	63.76	26.48	37.28	0.89	1.63	1.02	2.71	1.657	62.36	97.52	CH	Brownish grey, grey, Fat clay
11	2	BH2	U5	10.00	10.70							100.00	99.98	99.52	31.20	67.95	52.22	24.20	28.02	1.56	1.55	0.92	2.69	1.924	65.80	95.00	CH	Brownish grey, grey, Fat clay
Average value of layer 2										**100.00**	**99.99**	**99.97**	**99.84**	**99.13**	**39.48**	**63.76**	**58.53**	**27.81**	**30.71**	**1.17**	**1.59**	**0.97**	**2.70**	**1.778**	**64.00**	**96.72**	**CH**	**Brownish grey, grey, Fat clay**
12	3	BH1	U7	14.00	14.40					100.00	99.85	99.53	69.08	3.34									2.66				SP	Brownish grey, grey, Poorly graded sand
13	3	BH2	U6	12.00	12.40		100.00	88.97	82.07	74.50	70.69	67.27	60.77	27.67	5.32	23.24	28.60	18.36	10.24	0.48	2.02	1.64	2.65	0.616	38.12	99.98	SC	Bluish grey ,grey, Clayey sand with gravel
Average value of layer 3							**100.00**	**88.97**	**82.07**	**87.25**	**85.27**	**83.40**	**64.93**	**15.51**	**5.32**	**23.24**	**28.60**	**18.36**	**10.24**	**0.48**	**2.02**	**1.64**	**2.66**	**0.619**	**38.23**	**99.70**	**SC**	**Bluish grey, brownish grey, Clayey sand with gravel**
14	4	BH1	U8	16.00	16.50				100.00	99.73	99.33	98.83	94.05	83.52	45.93	32.36	49.59	24.90	24.69	0.30	1.88	1.42	2.73	0.923	47.9979	95.71	CL	Brownish grey, yellowish grey, Lean clay with sand
15	4	BH1	U9	18.00	18.40					100.00	99.70	99.22	95.89	83.94	32.23	33.01	49.23	19.89	29.34	0.45	1.87	1.41	2.71	0.922	47.9709	97.03	CL	Brownish grey, yellowish grey, Lean clay with sand
16	4	BH1	U10	20.00	20.40							100.00	99.74	94.91	50.06	27.30	47.90	22.57	25.33	0.19	1.97	1.55	2.74	0.768	43.4389	97.40	CL	Brownish grey, yellowish grey, Lean clay
17	4	BH1	U11	22.00	22.60					100.00	99.94	99.64	96.07	79.22	30.30	27.46	41.49	19.78	21.71	0.35	1.95	1.53	2.70	0.765	43.3428	96.92	CL	Brownish grey, yellowish grey, Lean clay with sand
18	4	BH1	U12	24.00	24.40					100.00	99.92	99.88	99.70	98.10	37.43	28.66	54.00	25.61	28.39	0.11	1.90	1.48	2.72	0.838	45.593	93.03	CH	Brownish grey, yellowish grey, Fat clay
19	4	BH1	U13	26.00	26.40			100.00	96.39	88.81	85.95	83.49	78.36	50.12	17.15	25.53	33.93	17.32	16.61	0.49	1.97	1.57	2.67	0.701	41.2111	97.24	CL	Yellowish grey, Sandy Lean clay
20	4	BH2	U7	14.00	14.50					100.00	99.98	99.94	99.30	98.13	50.89	31.15	60.75	25.55	35.20	0.16	1.90	1.45	2.74	0.890	47.0899	95.90	CH	yellowish brown, yellowish grey, Fat clay
21	4	BH2	U8	16.00	16.40				100.00	99.95	99.59	99.03	84.39	52.95	19.34	27.23	35.15	21.39	13.76	0.42	1.89	1.49	2.68	0.799	44.4136	91.33	CL	Yellowish grey, Sandy Lean clay
22	4	BH2	U9	18.00	18.40					100.00	99.84	99.80	99.52	66.74	9.87	27.21	36.38	21.19	15.19	0.40	1.92	1.51	2.67	0.768	43.4389	94.60	CL	Yellowish grey, Sandy Lean clay
23	4	BH2	U10	20.00	20.40					100.00	99.94	99.90	99.42	80.27	14.53	23.71	27.59	21.46	6.13	0.37	1.91	1.54	2.65	0.721	41.8942	87.14	CL-ML	Yellowish grey, Silty clay with sand
24	4	BH2	U11	22.00	22.40					100.00	99.98	99.90	99.14	73.96	13.70	24.07	27.98	21.84	6.14	0.36	1.89	1.52	2.65	0.743	42.6277	85.85	CL-ML	Yellowish grey, Silty clay with sand
Average value of layer 4								**100.00**	**98.80**	**98.85**	**98.42**	**98.15**	**95.05**	**78.35**	**29.22**	**27.97**	**42.18**	**21.95**	**20.23**	**0.30**	**1.91**	**1.50**	**2.70**	**0.801**	**44.471**	**94.18**	**CL**	**Brownish grey, yellowish grey, Lean clay with sand**
25	5	BH2	U12	24.00	24.40					100.00	99.92	99.76	98.78	37.32	8.15	24.46	27.77	20.15	7.62	0.57	1.99	1.60	2.66	0.663	39.8677	98.14	SC	Yellowish grey, Clayey sand
26	5	BH2	U13	26.00	26.40							100.00	99.98	37.47	5.09	21.59	26.34	17.79	8.55	0.44	1.99	1.64	2.65	0.616	38.12	92.88	SC	Brownish grey, Clayey sand
27	5	BH2	U14	28.00	28.40							100.00	94.90	35.76	8.88	21.09	25.27	17.17	8.10	0.48	2.00	1.65	2.65	0.606	37.73	92.23	SC	Brownish grey, Clayey sand
28	5	BH2	U15	30.00	30.40					100.00	99.98	99.96	98.42	33.97	7.31	20.95	24.60	17.57	7.03	0.48	2.06	1.7	2.67	0.571	36.35	97.96	SC	Brownish grey, Clayey sand
Average value of layer 5										**100.00**	**99.95**	**99.93**	**98.02**	**36.13**	**7.36**	**22.02**	**26.00**	**18.17**	**7.83**	**0.49**	**2.01**	**1.65**	**2.66**	**0.613**	**38.01**	**95.46**	**SC**	**Yellowish grey, brownish grey, Clayey sand**
29	6	BH1	U14	28.00	28.40					100.00	99.28	99.08	98.76	97.52	66.63	25.92	53.27	23.58	29.69	0.08	2.00	1.59	2.75	0.730	42.1965	97.64	CH	Blue, yellowish grey, reddish brown, Fat clay

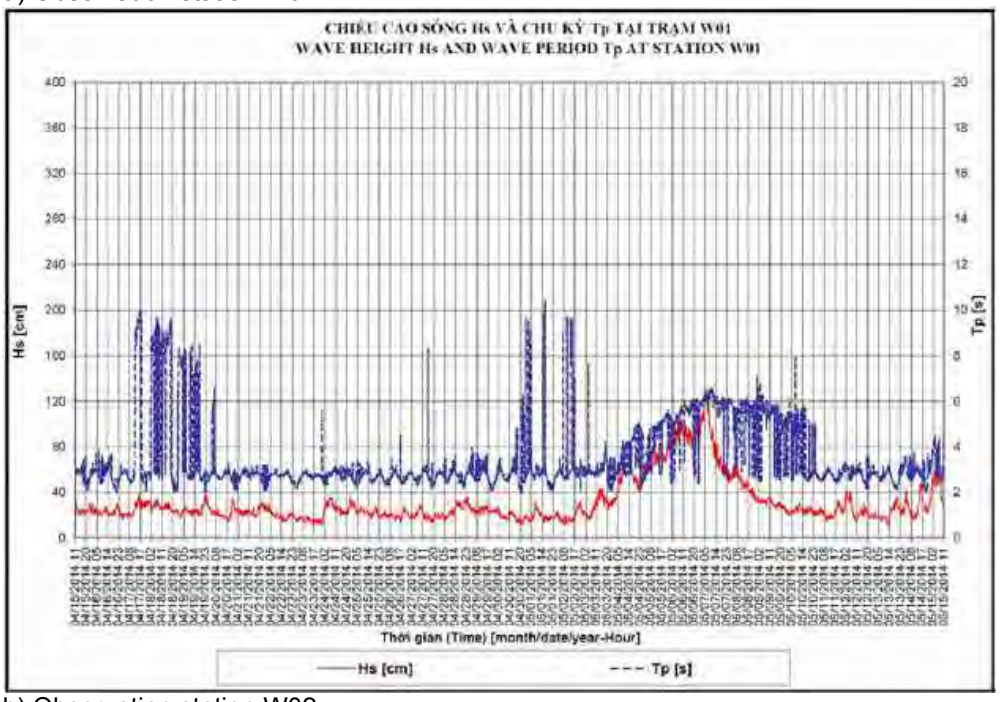
Table B-5(b) Laboratory test results

No.	TT No	Borehole	Sample No.	Depth (m)	Percent passed sieve size (mm)										Natural moisture content w (%)	Atterberg Limits				Bulk density (g/cm³)		Particle density Δ (g/cm³)	Void ratio eo	Porosity n (%)	Degree of saturation G (%)	Soil group	Description
				From - To	25	19	9.5	4.75	2.00	0.85	0.425	0.28	0.075	< 0.005		Liquid limit W_L(%)	Plastic limit Wp(%)	Plasticity index Ip (%)	Consistency (B)	Natural	Dry						
30	6	BH1	U15	30.00 - 30.40					100.00	99.76	99.36	98.64	97.04	36.89	24.60	47.03	20.31	26.72	0.16	2.00	1.61	2.71	0.683	40.5823	97.61	CL	Blue, brownish grey, Lean clay
31	6	BH1	U16	32.00 - 32.40					100.00	99.70	99.50	98.88	95.93	40.54	23.54	46.19	20.85	25.34	0.11	2.03	1.64	2.72	0.659	39.7227	97.16	CL	Blue, brownish grey, Lean clay
32	6	BH1	U17	34.00 - 34.60							100.00	99.98	99.96	54.74	28.97	62.30	27.76	34.54	0.04	1.96	1.52	2.74	0.803	44.5369	98.85	CH	Blue, brownish grey, yellowish grey, Fat clay
33	6	BH1	U18	36.00 - 36.50							100.00	99.94	99.68	45.81	29.60	60.65	26.73	33.92	0.08	1.95	1.50	2.73	0.820	45.0549	98.55	CH	Blue, brownish grey, Fat clay
34	6	BH1	U19	38.00 - 38.40					100.00	99.96	99.92	96.52	85.65	30.40	29.27	51.86	24.59	27.27	0.17	1.93	1.49	2.70	0.812	44.8124	97.33	CH	Blue, brownish grey, Fat clay
35	6	BH2	U16	32.00 - 32.40					100.00	99.90	99.82	95.89	71.38	23.18	26.44	34.65	19.23	15.42	0.47	1.97	1.56	2.68	0.718	41.79	98.69	CL	Grey, brownish grey, Lean clay with sand
36	6	BH2	U17	34.00 - 34.40							100.00	99.98	99.96	47.05	31.25	63.12	28.89	34.23	0.07	1.92	1.46	2.72	0.863	46.32	98.49	CH	Grey, brownish grey, Fat clay
37	6	BH2	U18	36.00 - 36.40					100.00	99.90	99.82	97.22	63.12	24.55	21.22	40.15	19.89	20.26	0.07	2.06	1.7	2.69	0.582	36.79	98.08	CL	Blue, Sandy lean clay
38	6	BH2	U19	38.00 - 38.40					100.00	99.98	99.88	97.14	68.43	21.44	22.92	40.84	23.01	17.83	< 0	2.03	1.65	2.68	0.624	38.42	98.44	CL	Blue, Sandy lean clay
Average value of layer 6									**100.00**	**99.78**	**99.74**	**98.30**	**87.87**	**39.12**	**26.37**	**50.01**	**23.48**	**26.52**	**0.11**	**1.99**	**1.57**	**2.71**	**0.725**	**42.04**	**98.63**	**CH**	**Bluish grey, brownish grey, Fat clay**
39	7	BH1	D20	40.00 - 40.45					100.00	99.87	95.54	34.19	8.81			21.23	16.70	4.53				2.65				SP-SC	Grey, yellowish grey, Poorly graded sand with silty clay
40	7	BH1	D21	42.00 - 42.45					100.00	99.79	95.32	36.61	8.78			18.98	14.36	4.62				2.66				SP-SC	Grey, bluish grey, Poorly graded sand with silty clay
Average value of layer 7									**100.00**	**99.83**	**95.43**	**35.40**	**8.80**			**20.11**	**15.53**	**4.58**				**2.66**				**SP-SC**	**Grey, bluish grey, yellowish grey, Poorly graded sand with silty clay**
41	8	BH1	U22	44.00 - 44.40					100.00	99.98	99.88	97.14	68.43	5.80	22.05	28.65	19.55	9.10	0.27	1.95	1.60	2.65	0.656	39.6135	89.07	CL	Grey, brownish grey, Sandy Lean clay
42	8	BH1	U23	46.00 - 46.25	100.00	83.17	76.73	73.92	72.62	71.41	70.52	69.81	66.08	17.81	21.99	44.27	21.20	23.07	0.03	2.02	1.66	2.69	0.620	38.2716	95.41	CL	Bluish grey, Sandy Lean clay
43	8	BH2	U20	40.00 - 40.40					100.00	99.98	99.96	99.68	82.32	9.72	23.93	27.91	22.39	5.52	0.28	1.90	1.53	2.65	0.732	42.26	86.63	CL-ML	Brownish grey, Silty clay with sand
44	8	BH2	U21	42.00 - 42.40						100.00	99.96	99.72	93.98	8.11	24.64	29.57	22.64	6.93	0.28	1.85	1.48	2.65	0.791	44.17	82.55	CL-ML	Brownish grey, Silty clay
Average value of layer 8					**100.00**	**83.17**	**76.73**	**73.92**	**90.87**	**92.84**	**92.58**	**91.59**	**77.70**	**10.36**	**23.15**	**32.60**	**21.45**	**11.16**	**0.15**	**1.93**	**1.57**	**2.66**	**0.697**	**41.071**	**88.36**	**CL**	**Grey, bluish grey, brownish grey, Sandy Lean clay**
45	9	BH2	U22	44.00 - 44.40						100.00	99.98	99.92	99.64	37.44	32.79	53.07	23.14	29.93	0.32	1.89	1.42	2.71	0.908	47.59	97.86	CH	Brownish grey, Fat clay
46	9	BH2	U23	46.00 - 46.40							100.00	99.92	99.54	31.22	29.84	46.45	21.99	24.46	0.32	1.94	1.49	2.70	0.812	44.81	99.22	CL	Brownish grey, Lean clay
47	9	BH2	U24	48.00 - 48.40						100.00	99.96	99.90	99.84	59.41	25.62	58.46	25.35	33.11	0.01	2.00	1.59	2.73	0.717	41.76	97.55	CH	Blue, Fat clay
48	9	BH2	U25	49.60 - 50.00							100.00	99.86	97.82	48.31	23.70	42.15	20.83	21.32	0.13	2.03	1.64	2.72	0.659	39.72	97.82	CL	Brownish grey, Lean clay
Average value of layer 9										**100.00**	**99.99**	**99.90**	**99.21**	**44.10**	**27.99**	**50.04**	**22.83**	**27.21**	**0.19**	**1.97**	**1.54**	**2.72**	**0.769**	**43.462**	**98.85**	**CH**	**Brownish grey, bluish grey, Fat clay**
49	10	BH1	U24	48.00 - 48.40					100.00	99.30	98.62	93.61	40.51	6.50	21.57	25.94	18.90	7.04	0.38	2.04	1.68	2.65	0.577	36.5885	99.06	SC	Bluish grey, Clayey sand
50	10	BH1	U25	49.60 - 50.00			100.00	98.87	95.82	91.03	86.81	73.02	45.07	5.55	25.02	30.12	20.60	9.52	0.46	1.99	1.59	2.65	0.667	40.012	99.40	SC	Bluish grey, Clayey sand
Average value of layer 10							**100.00**	**98.87**	**97.91**	**95.17**	**92.72**	**83.32**	**42.79**	**6.02**	**23.30**	**28.03**	**19.75**	**8.28**	**0.43**	**2.02**	**1.64**	**2.65**	**0.621**	**38.302**	**99.44**	**SC**	**Bluish grey, Clayey sand**

B3 Sea State Condition Survey

The time courses of turbidity, water temperature, salinity at wave observation stations are shown.

a) Observation station W01



b) Observation station W02

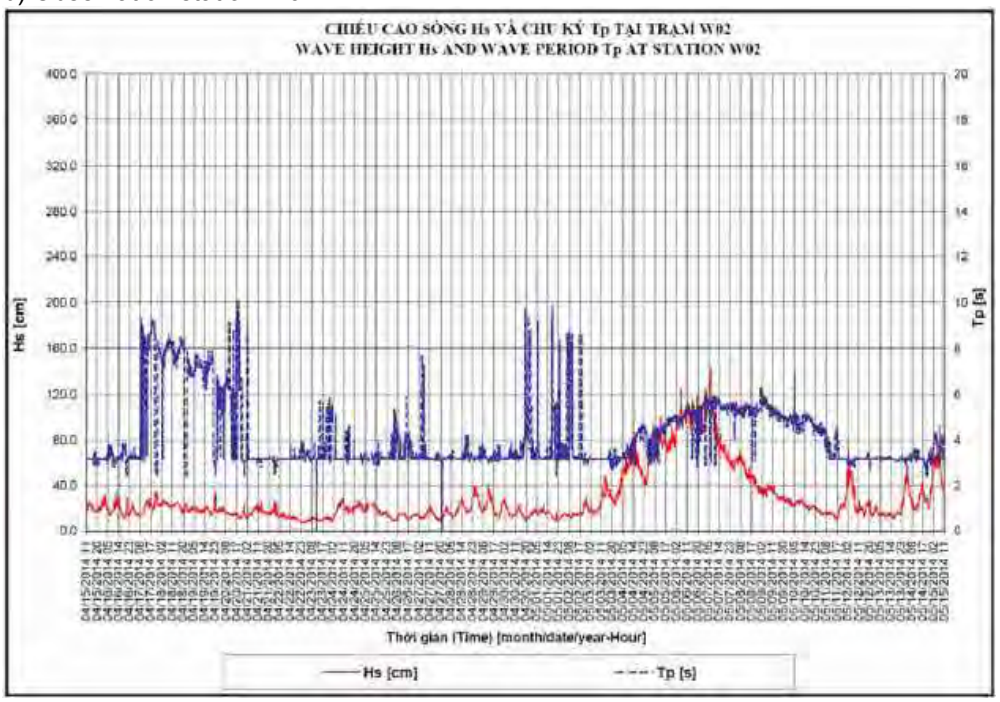
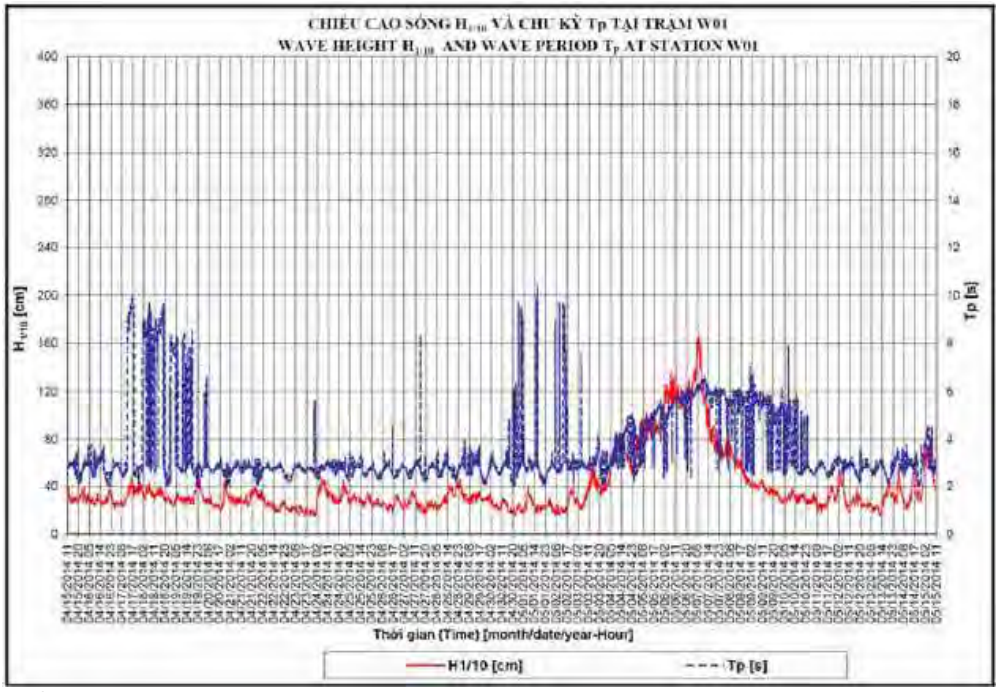


Figure B-5 wave height H_S(cm)、FrequencyT_P(h)

a) Observation station W01



b) Observation station W02

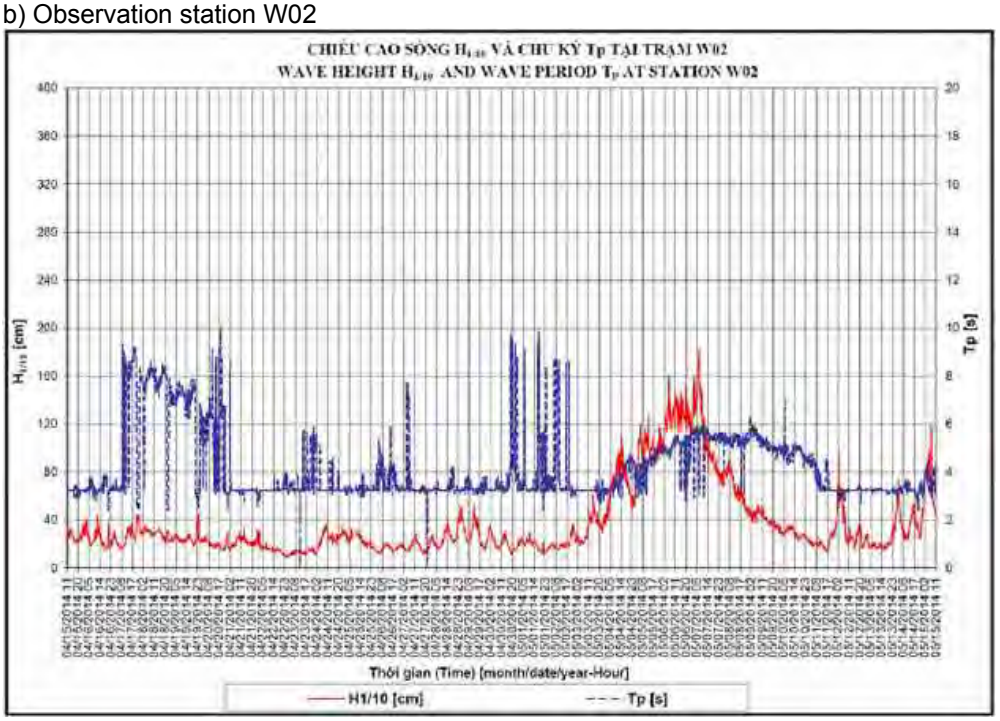
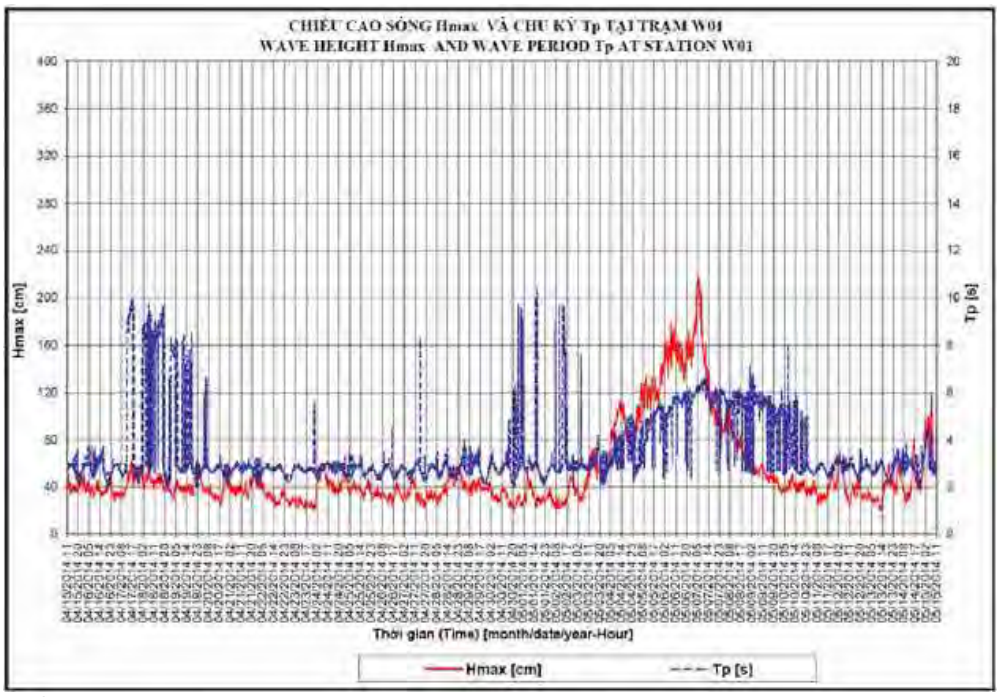


Figure B-6 Wave height $H_{1/10}$(cm)、FrequencyTp(h)

a) Observation station W01



b) Observation station W02

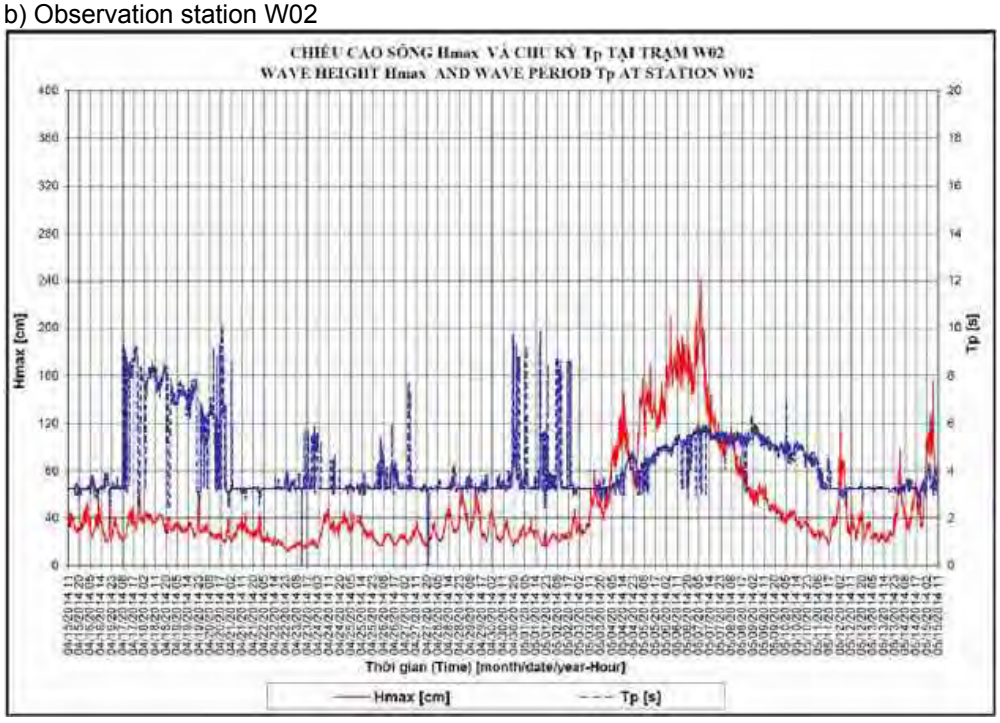
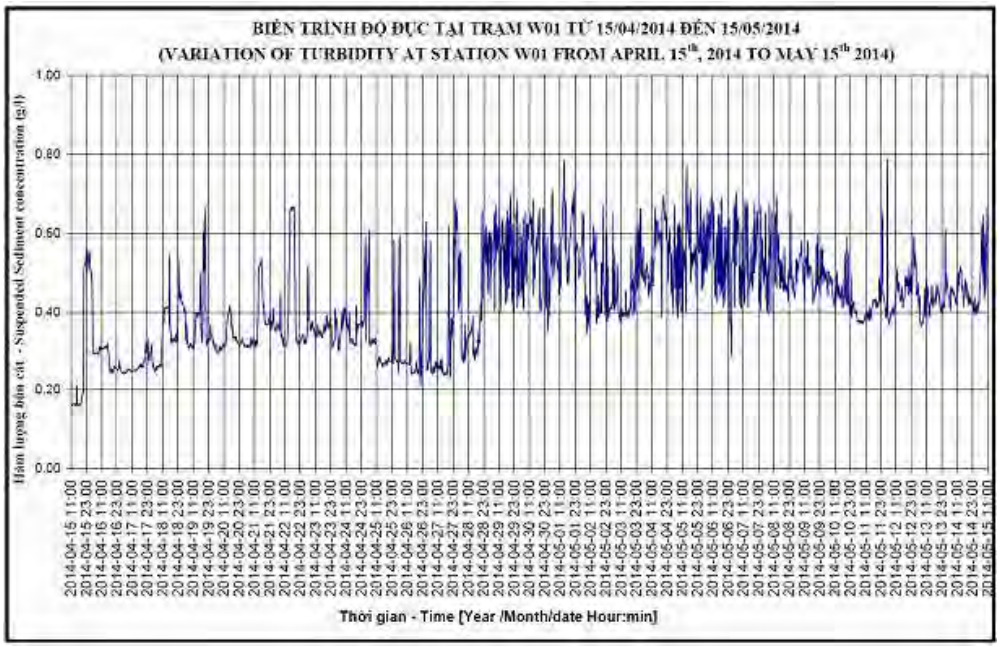


Figure B-7 Wave height H_{max}(cm)、FrequencyTp(h)

a) Observation station W01



b) Observation station W02

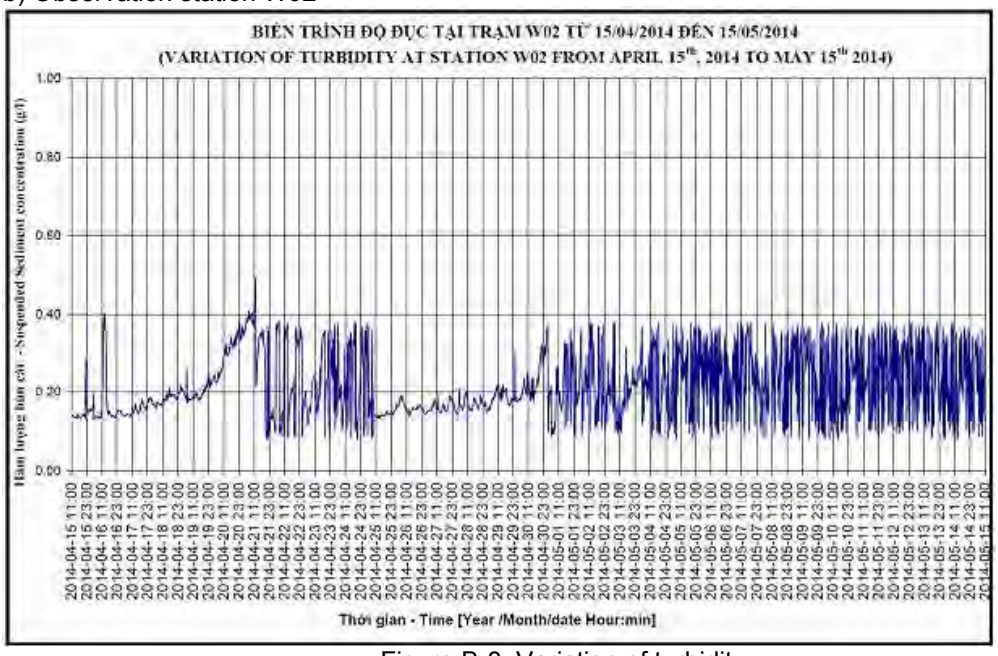
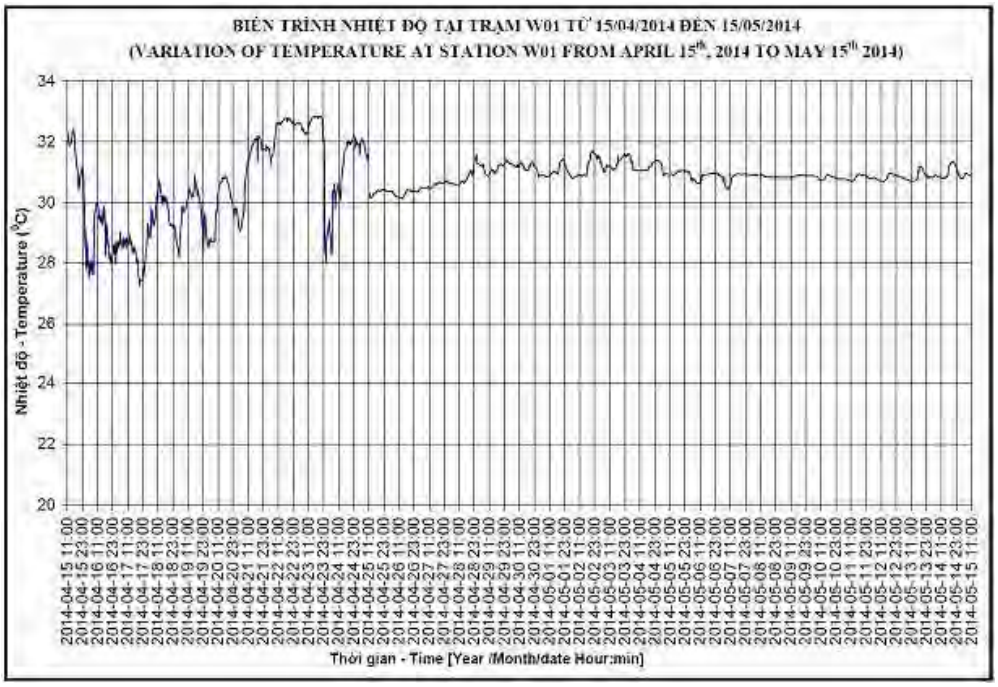


Figure B-8 Variation of turbidity

a) Observation station W01



b) Observation station W02

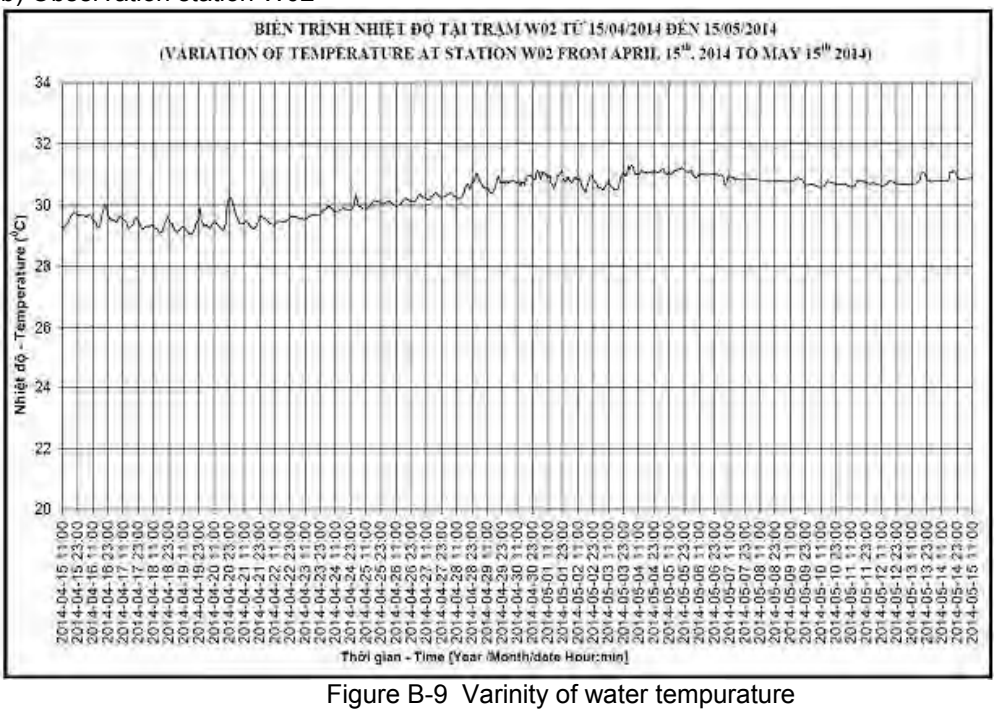
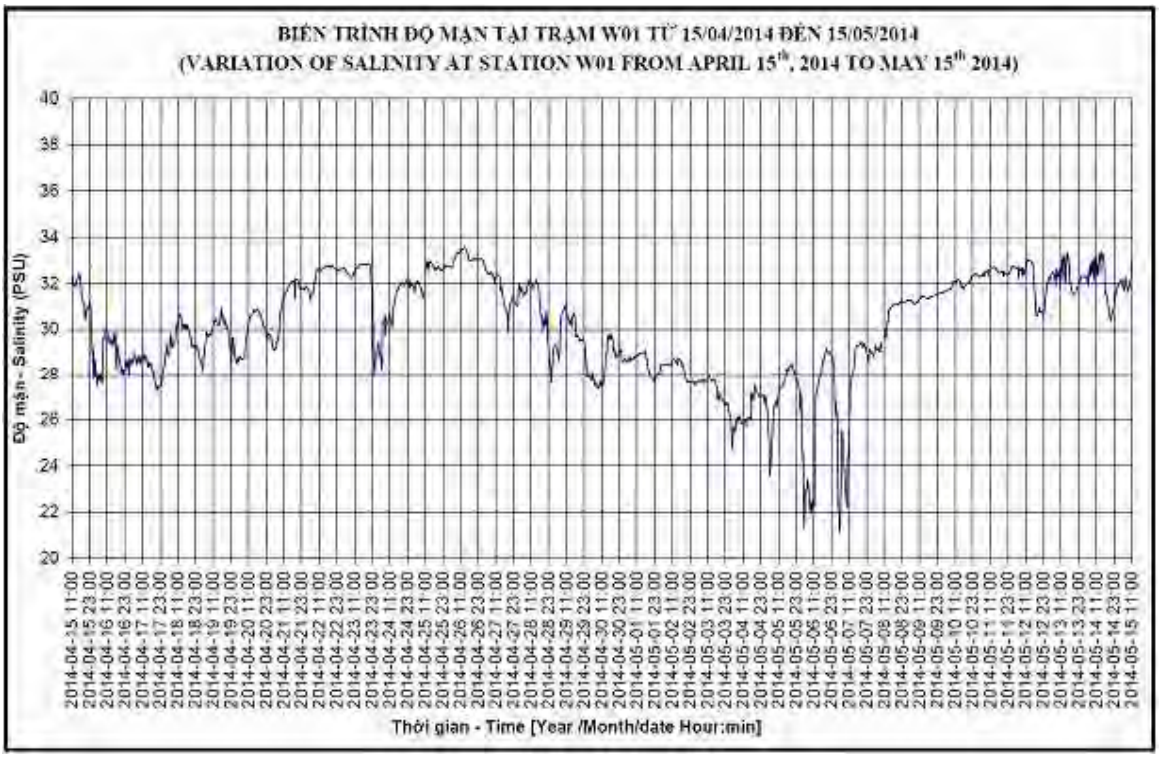


Figure B-9 Varinity of water tempurature

a) Observation station W01

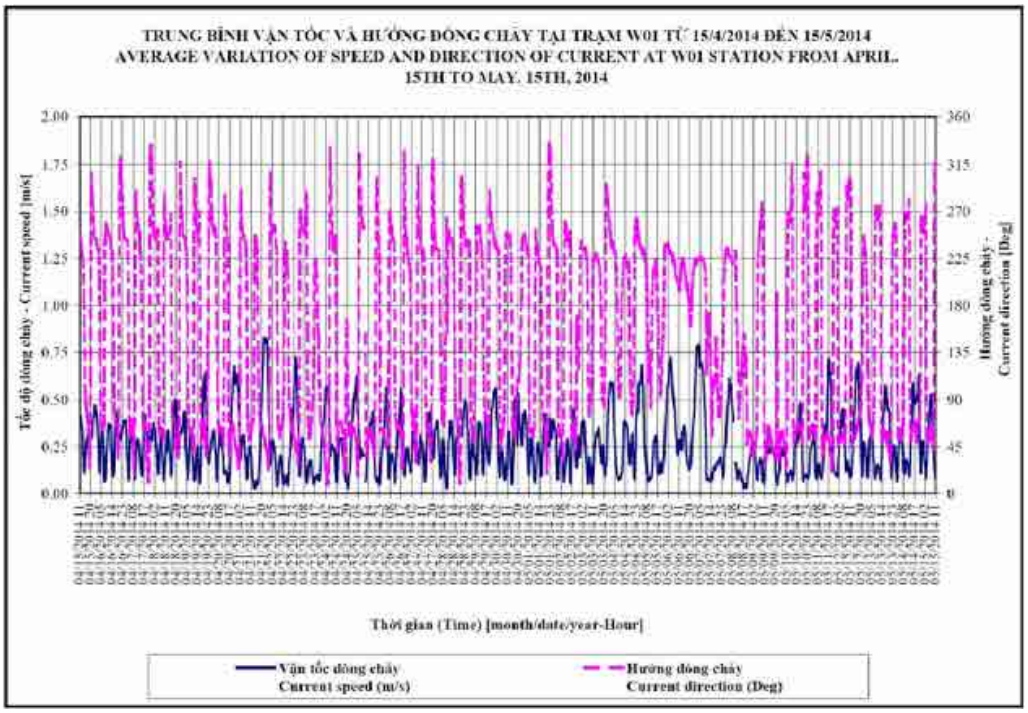


b) Observation station W02

Figure B-10 Variation of salinity

The variation of wave velocity, wave direction and water pressure were shown in Figure B-11 to Figure B-13. The Figure B-14, Figure B-15 showed the variation of wave velocity, wave direction of 3 layers (Upper layer:T=0.2H, medium layer: T=0.6H, lower layer: seabed) and the average.

a) Observation station W01



b) Observation station W02

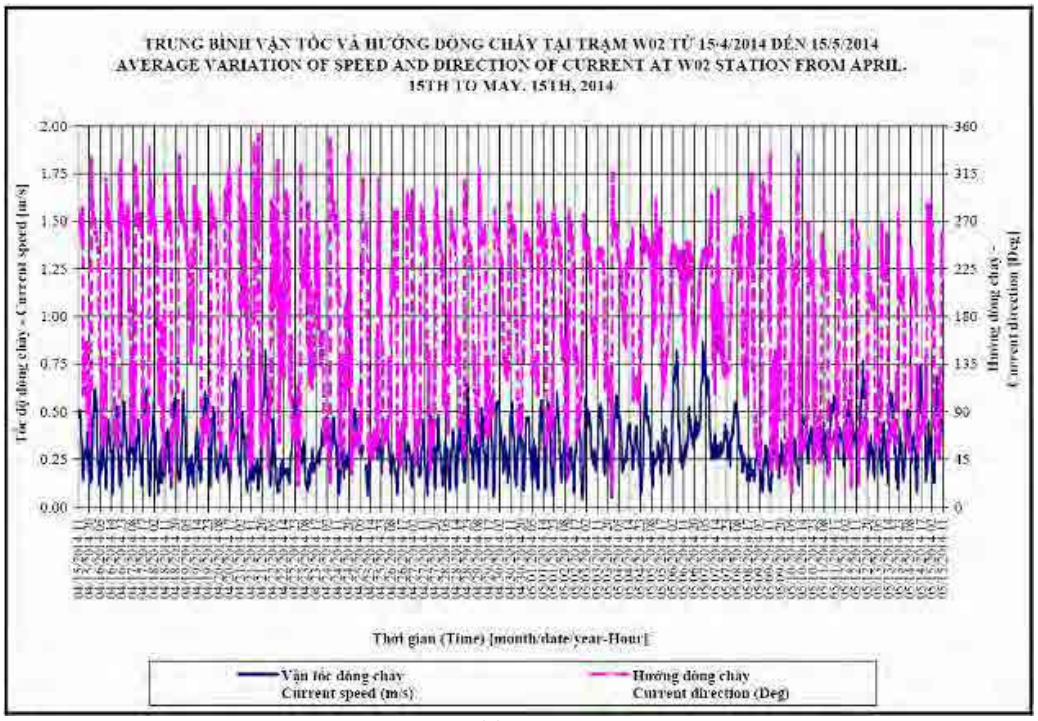
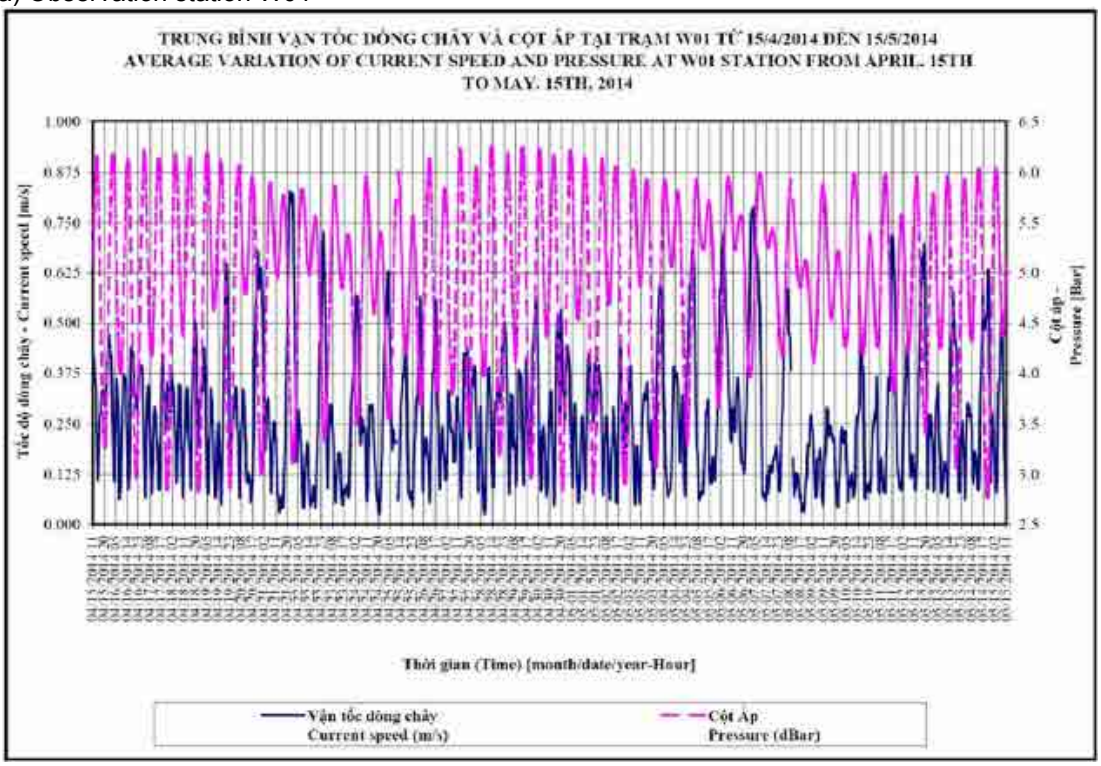


Figure B-11 Variation of flow velocity and direction

a) Observation station W01



b) Observation station W02

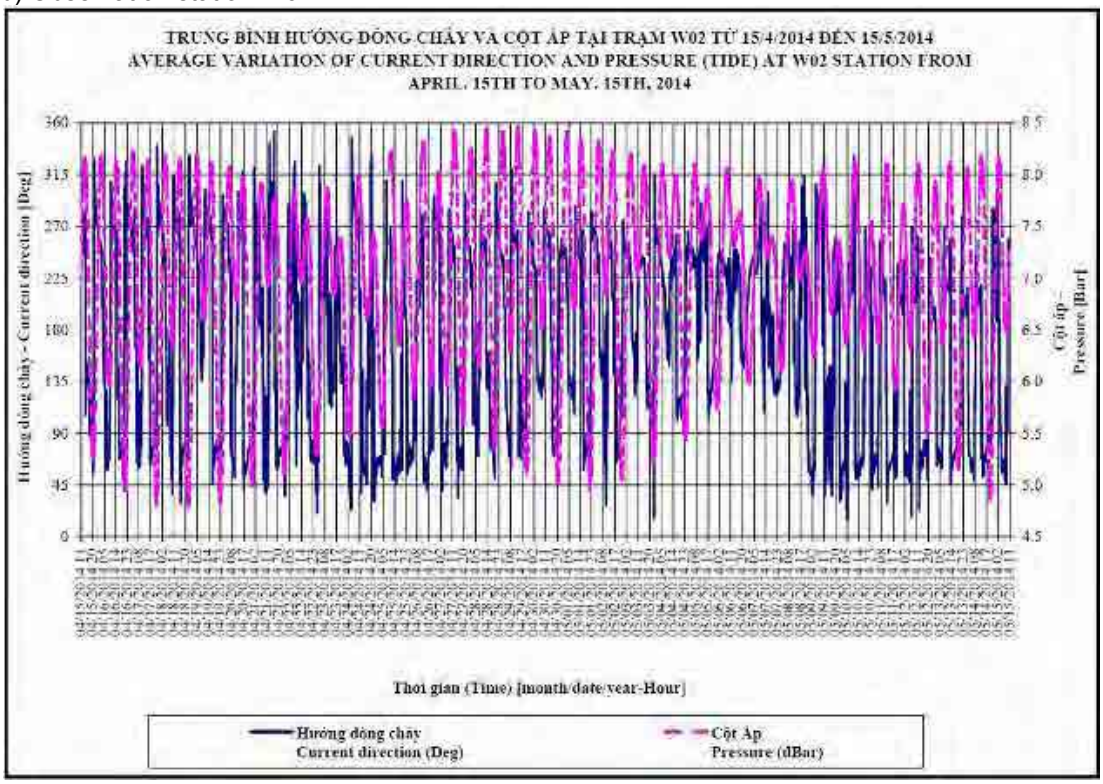
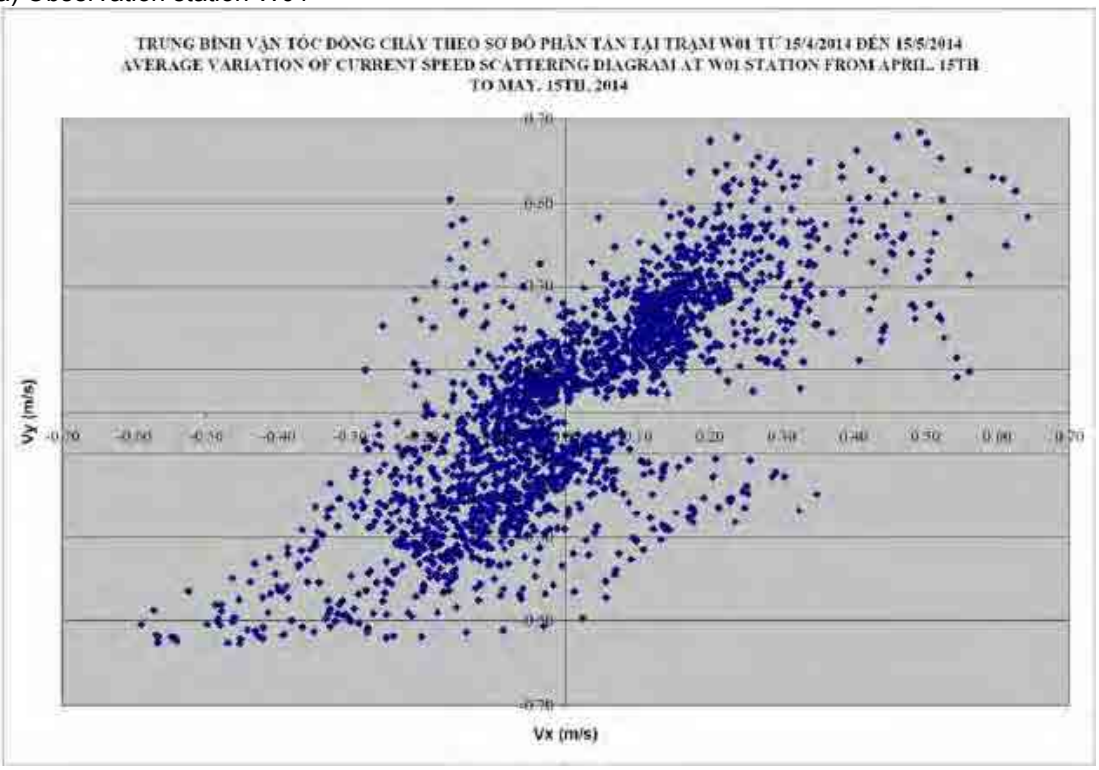


Figure B-12 Variation of flow direction and pressure

a) Observation station W01



b) Observation station W02

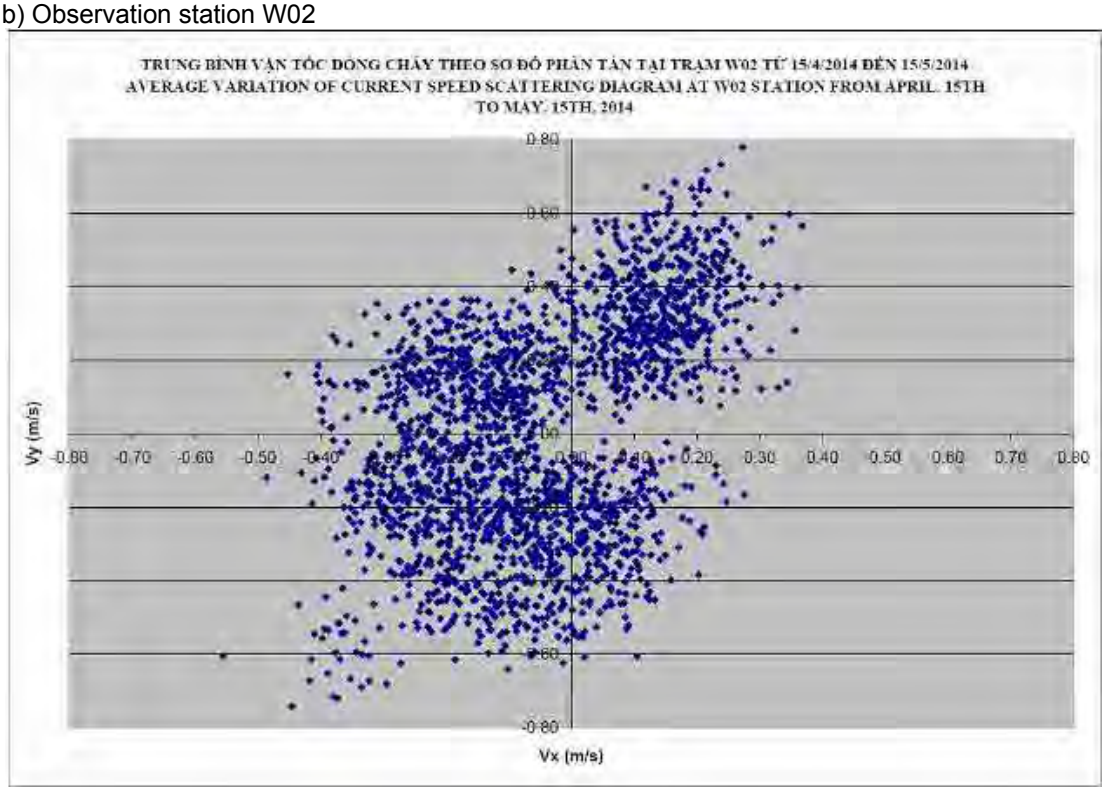
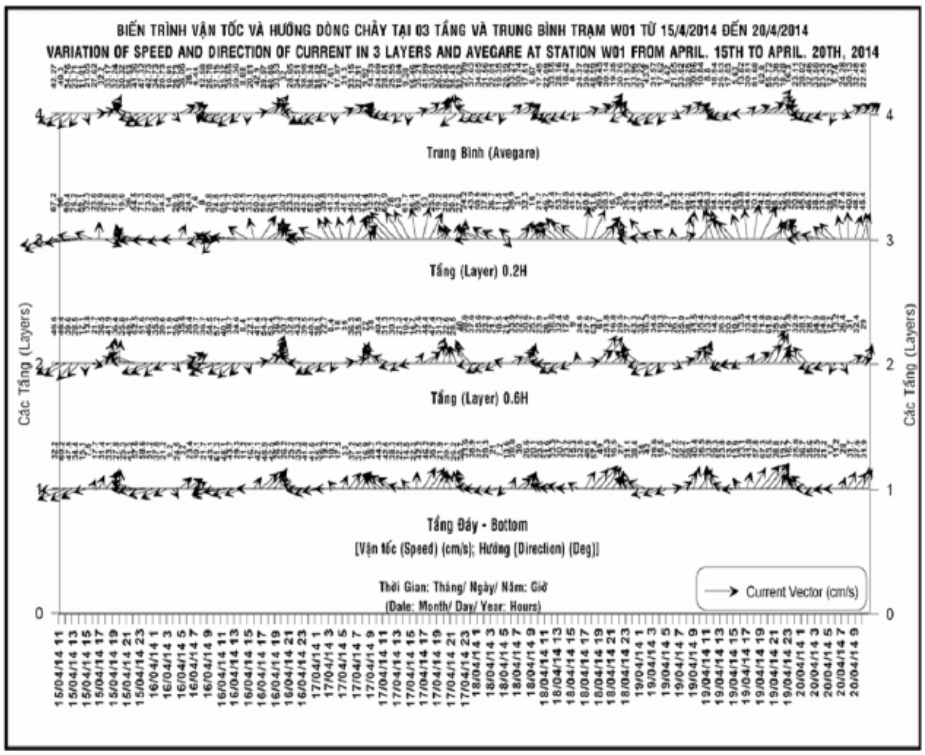
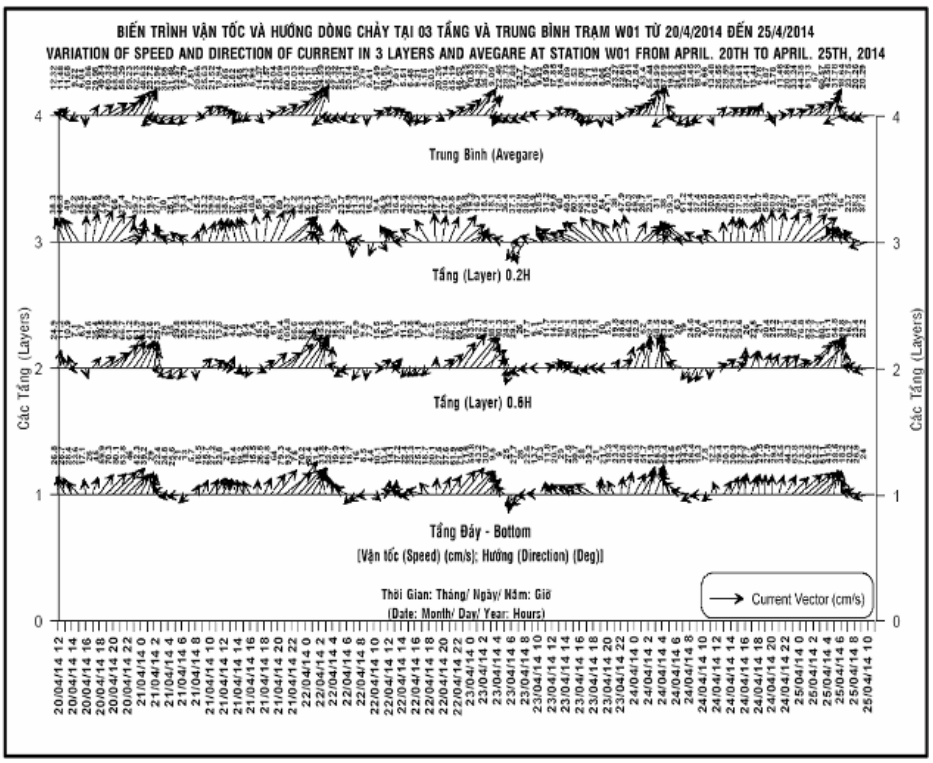


Figure B-13 Variation of flow velocity diagram

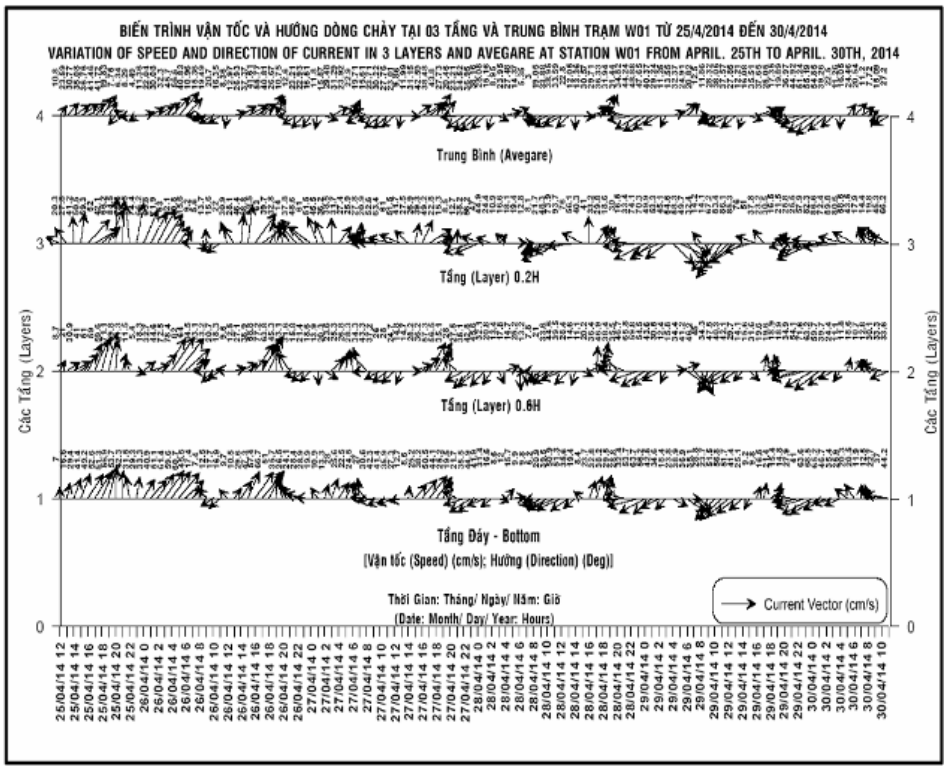
1) Period : 15/04~20/04



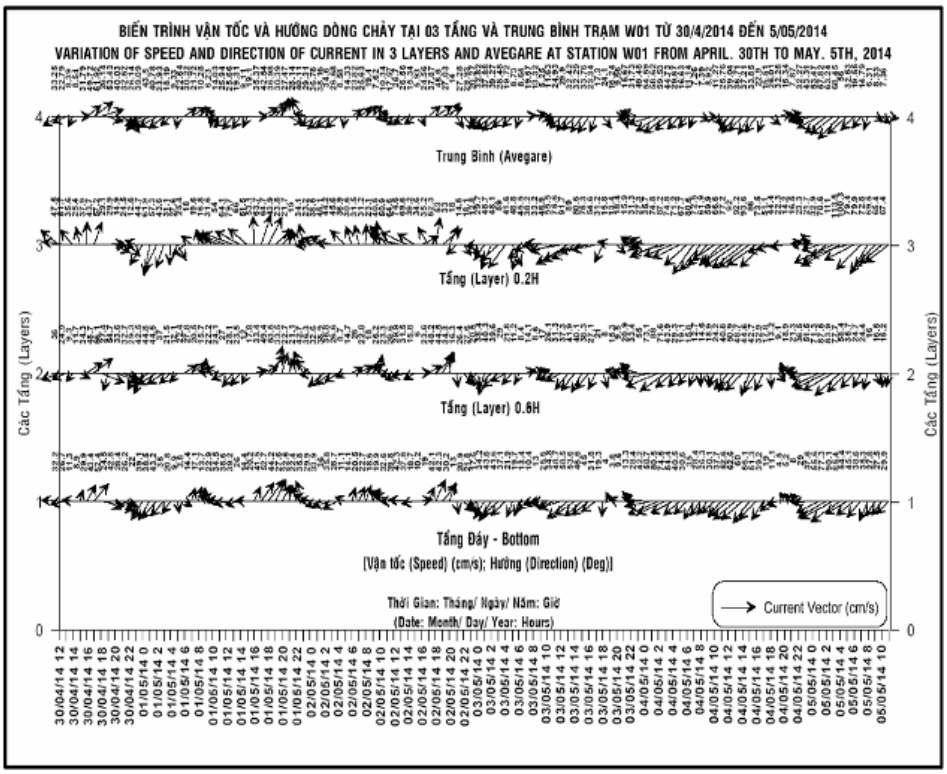
2) Period : 20/04~25/04



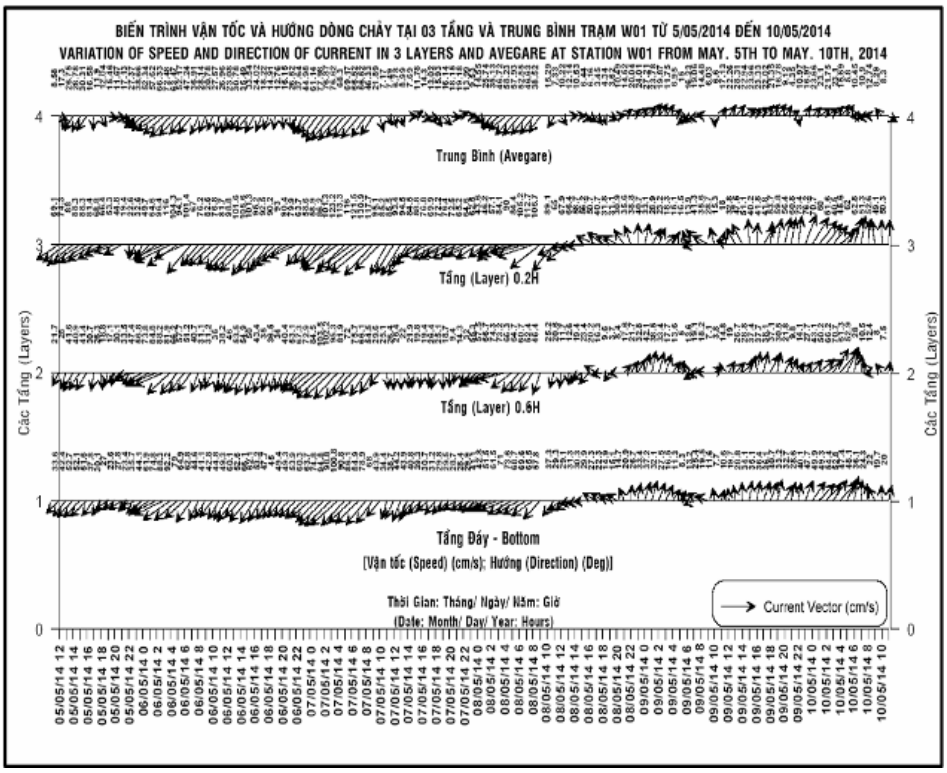
3) Period : 25/04~30/04



4) Period : 30/04~05/05



5) Period：05/05~10/05



6) Period：10/05~15/05

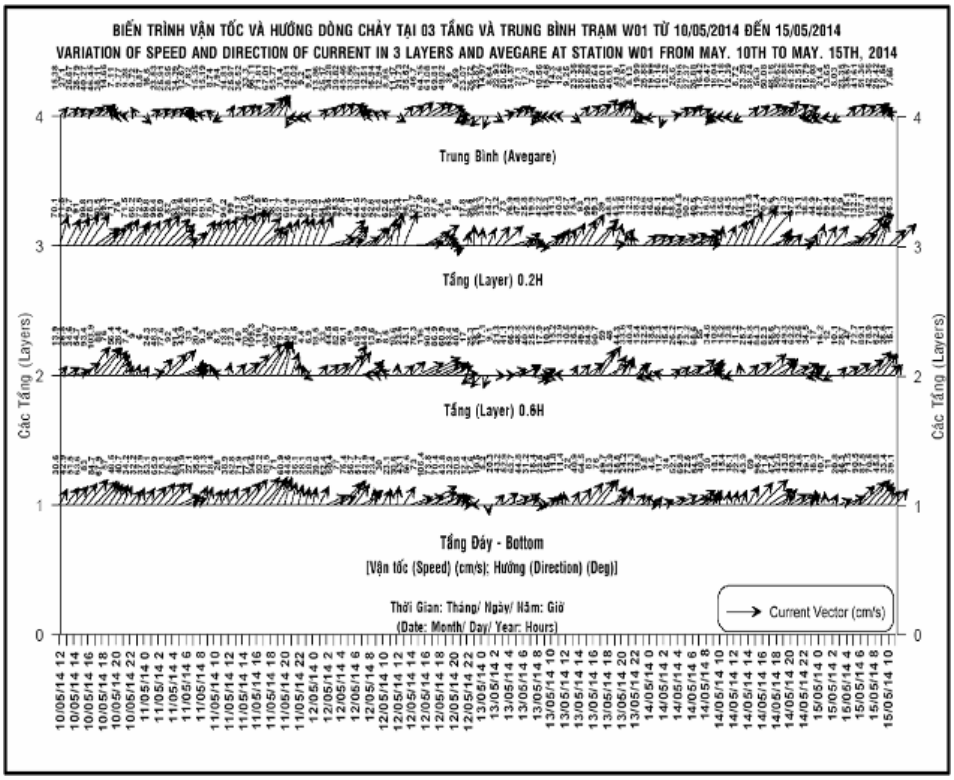
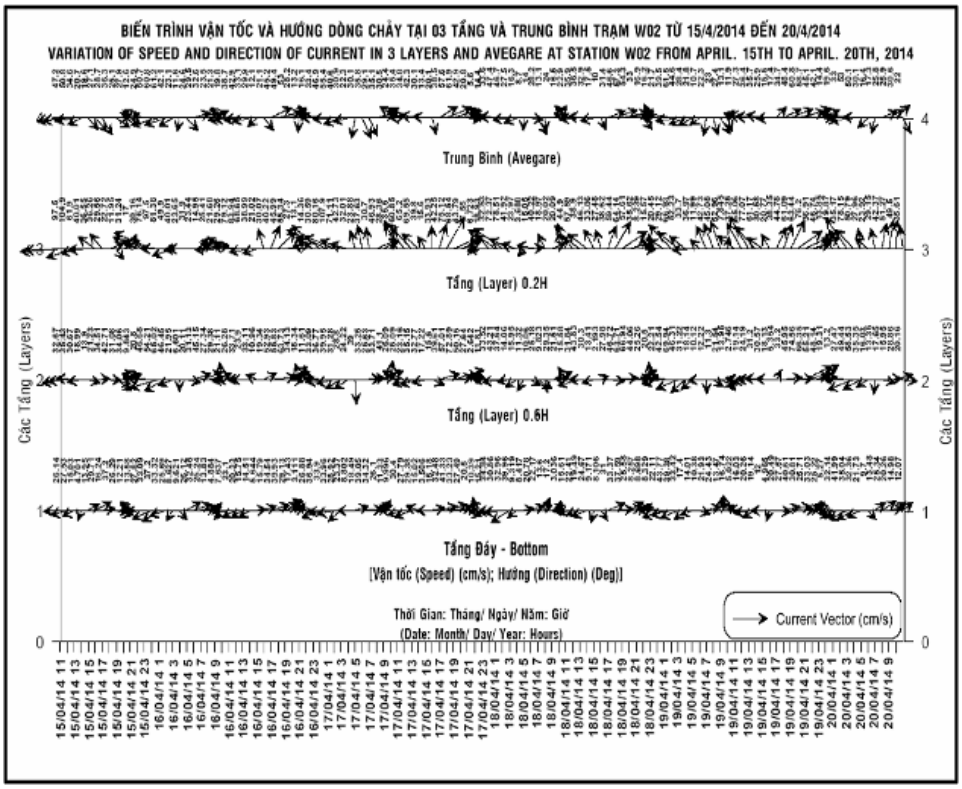
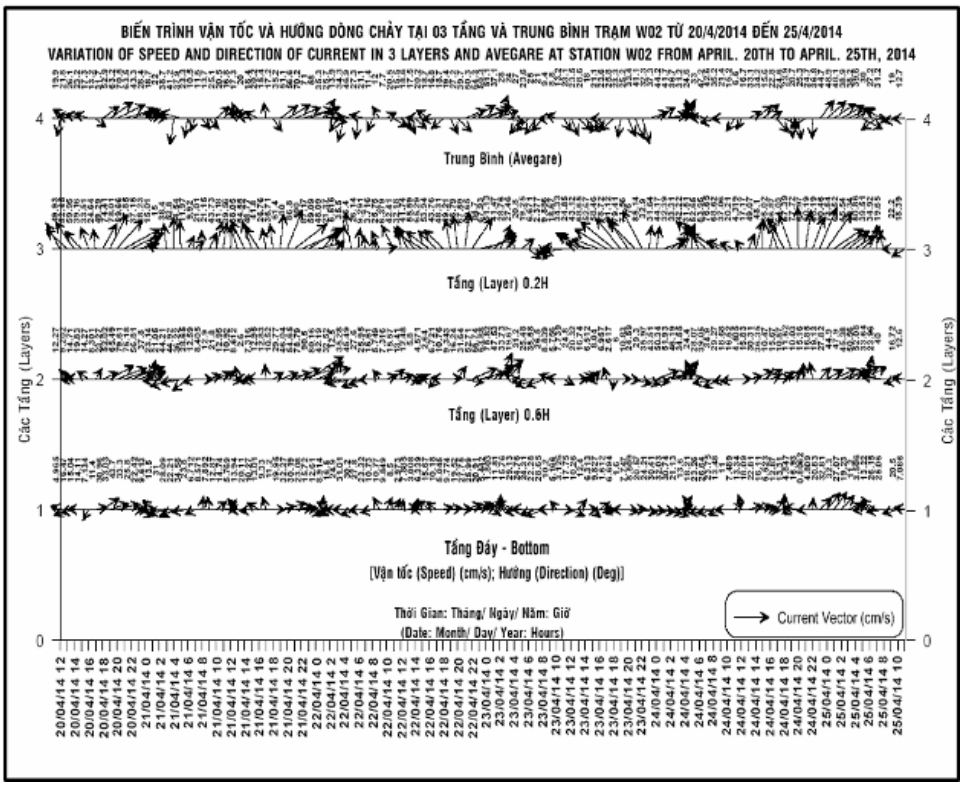


Figure B-14 Variation of flow velocity in each layers （Station：W01）

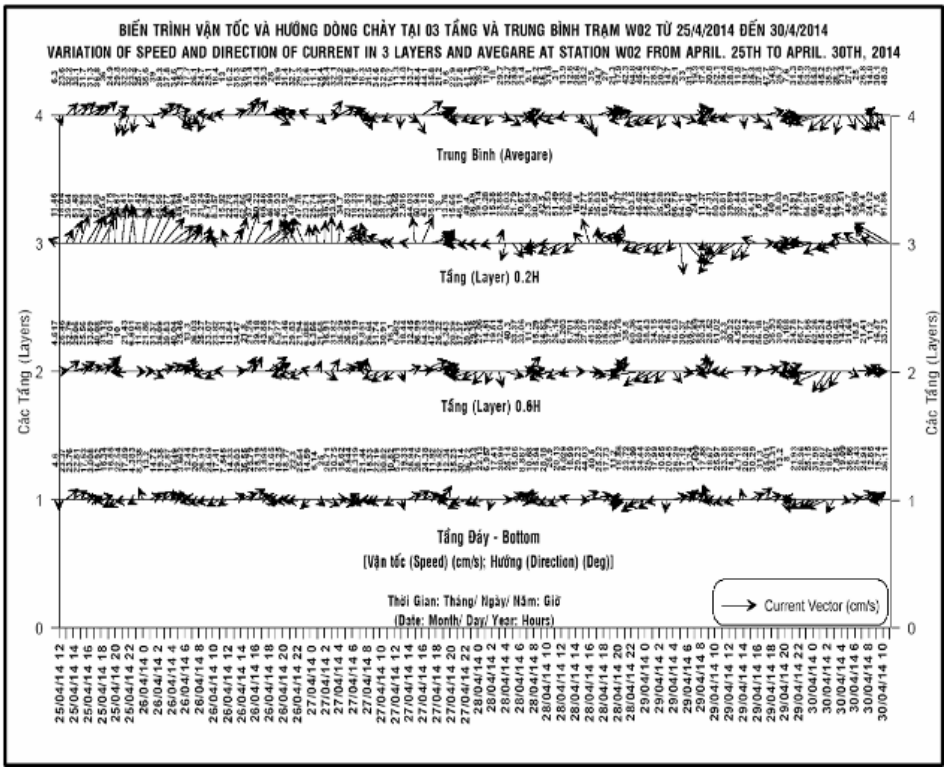
1) Period : 15/04~20/04



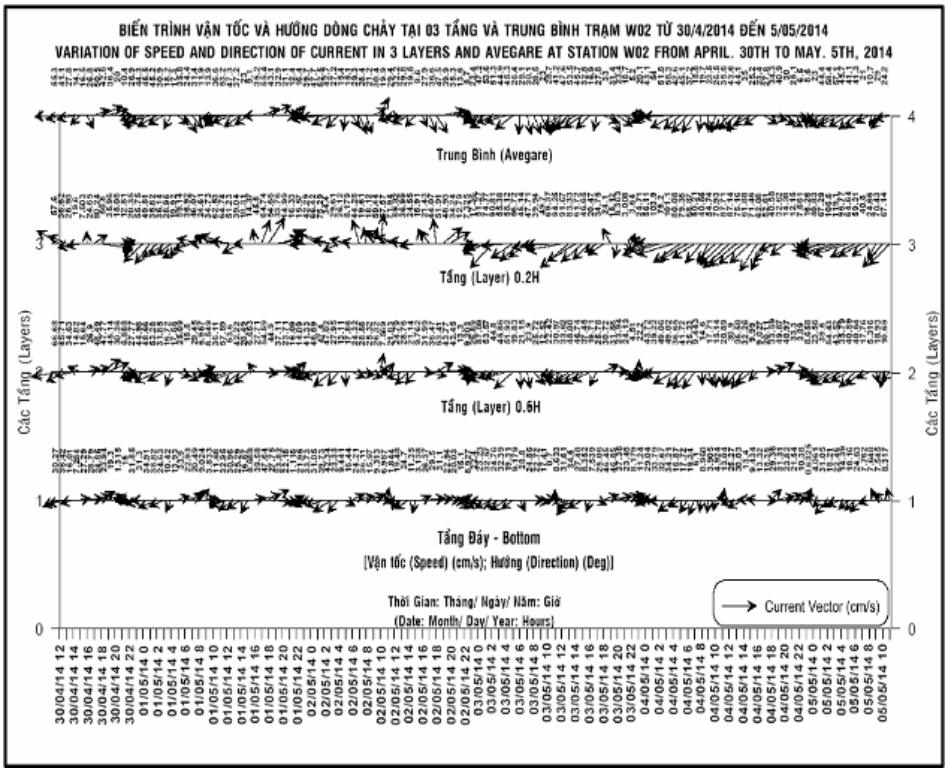
2) Period : 20/04~25/04



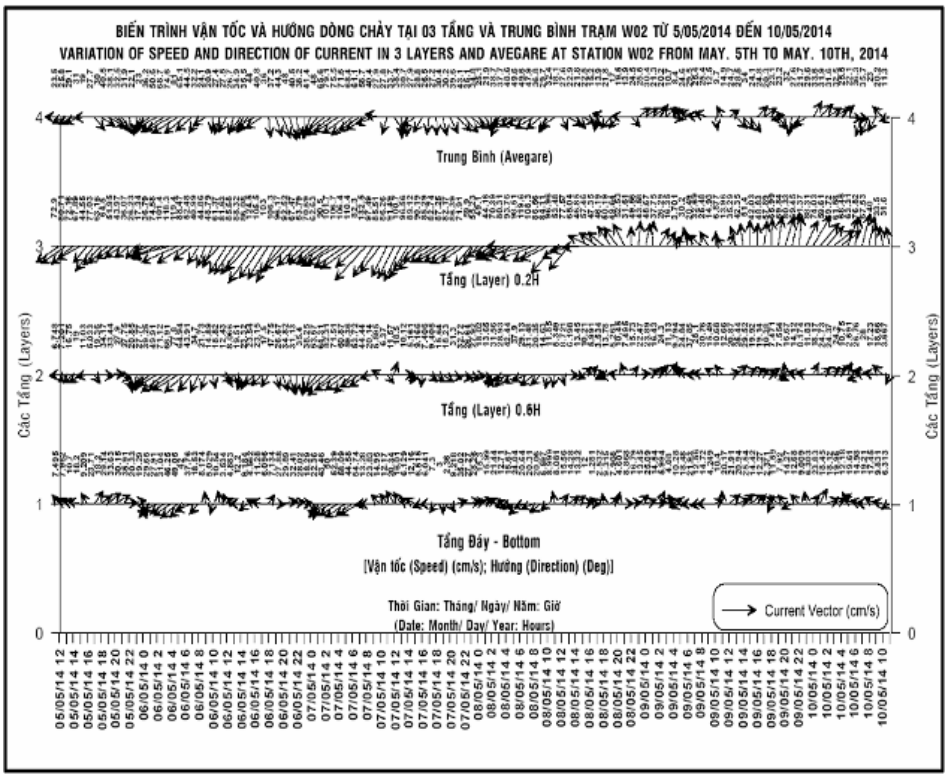
3) Period : 25/04~30/04



4) Period : 30/04~05/05



5) Period：05/05~10/05



6) Period：10/05~15/05

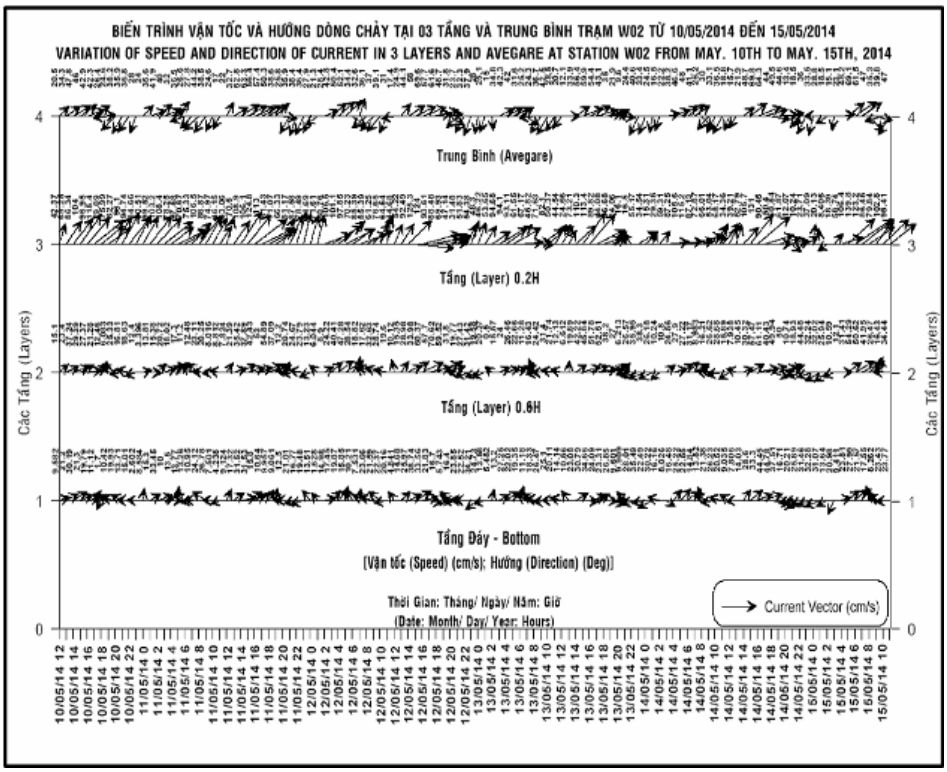


Figure B-15 Variation of flow velocity in each layers（Station：W02）

Appendix-C

Wave deformation analysis

C1 Wave deformation analysis

2 different areas of simulated area for wave deformation analysis were considered as follows. Figure C-2 and Figure C-3 show distribution of water depth at each area.

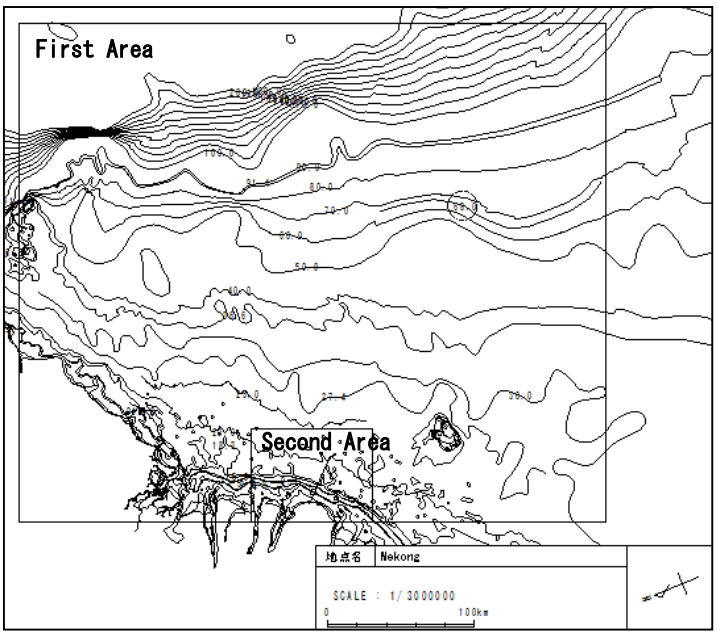


Figure C-1 simulated area

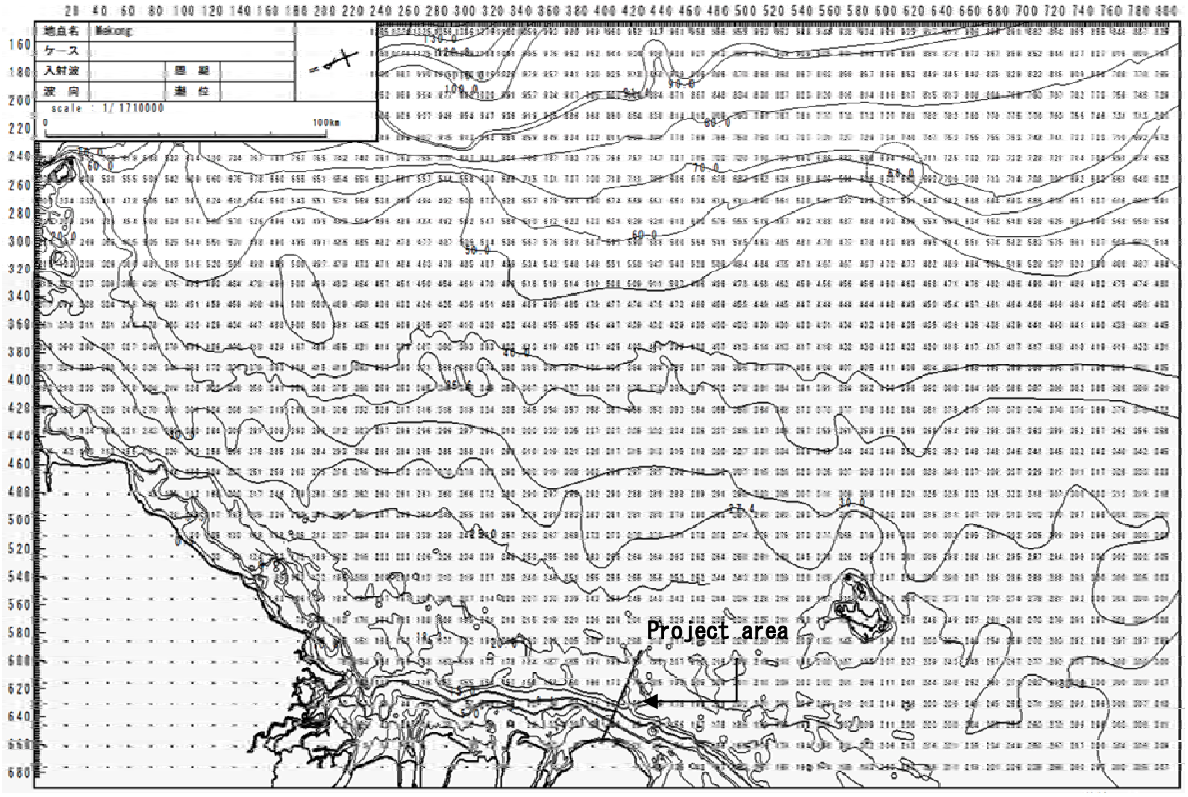


Figure C-2 Distribution of water depth in first simulated area

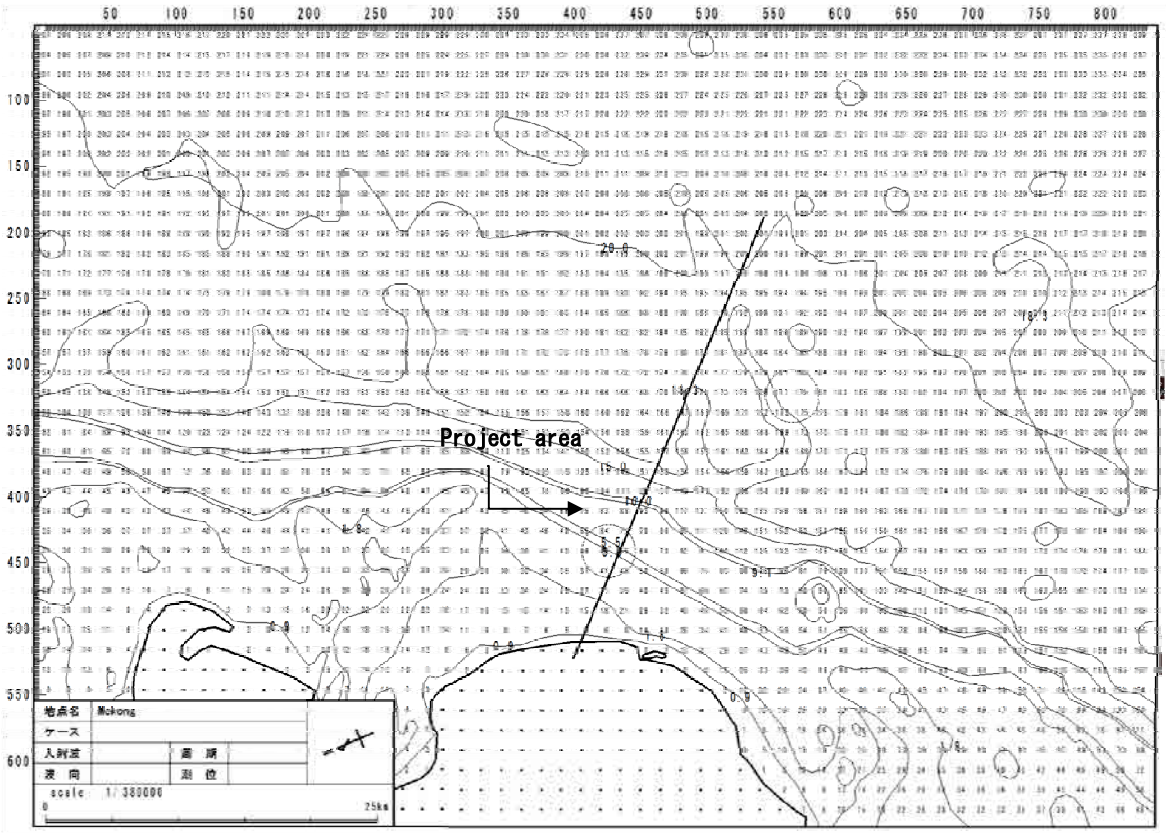


Figure C-3 Distribution of water depth in Second simulated area

Offshore wave height and period for several return periods has been obtained through the extreme statistics analysis of estimated ocean wave data which were obtained by using the nearby typhoon record during the period of 1977 to 2012.

Table C-1 Offshore wave height and period for several return periods.

Return Period	Wave Height (m)	Period(s)
1	3.67	7.5
3	4.43	8.4
5	4.79	8.9
10	5.27	9.4
25	5.90	10.1
50	6.38	10.6
100	6.86	11.1

Source: JICA Study Team

From this result, it is determined that H_0=6.38m and T_0=10.6s as design offshore wave**.** Wave deformation analysis by energy balance equation has been done to obtain the design wave height for each water depth. The results of this simulation are shown as below.

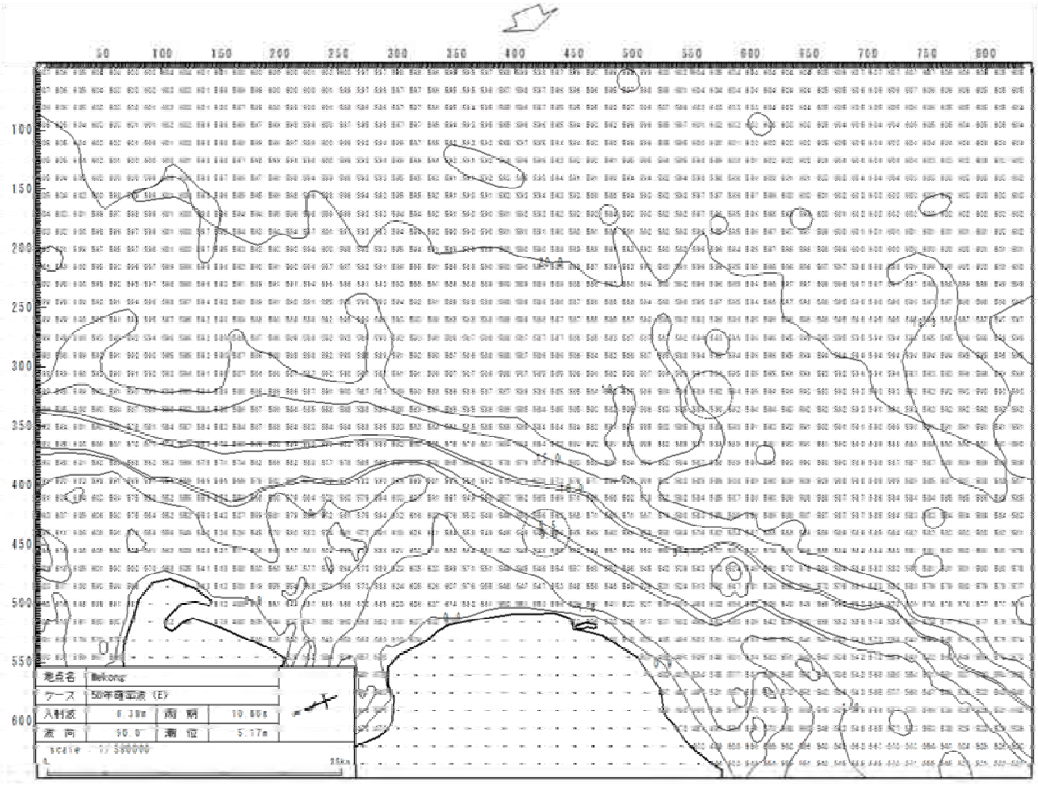


Figure C-4 The equivalent deepwater wave height (Direction of incident wave: E)

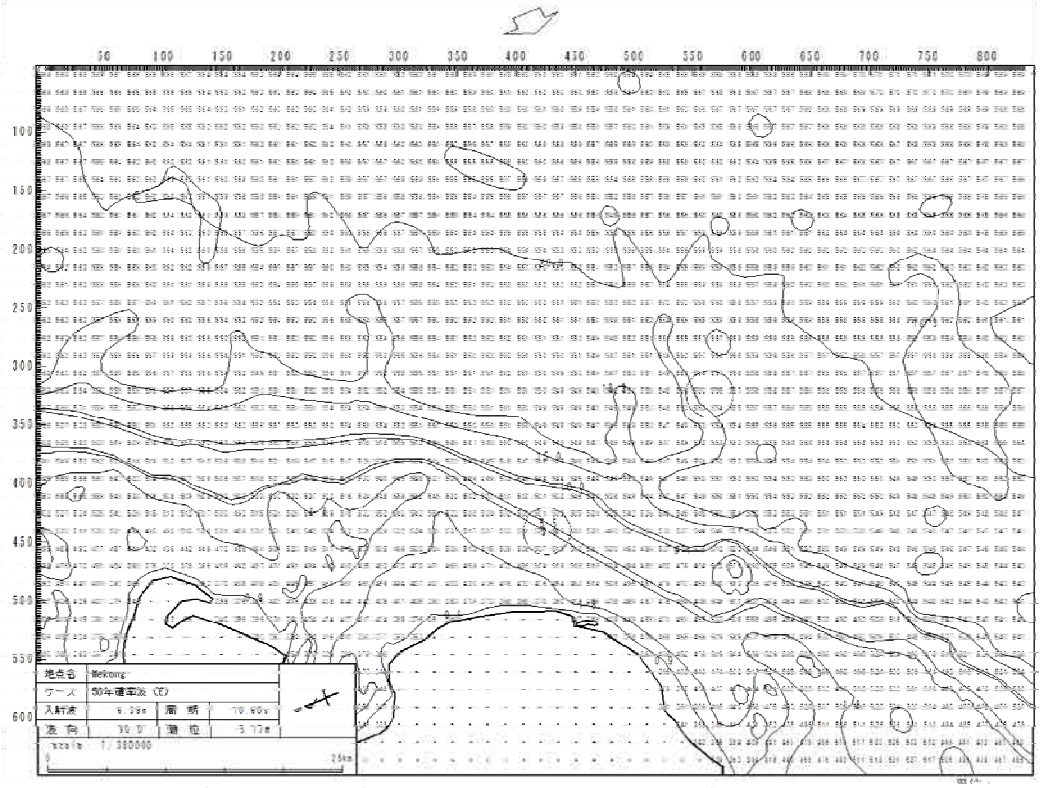


Figure C-5 The significant wave height (Direction of incident wave: E)

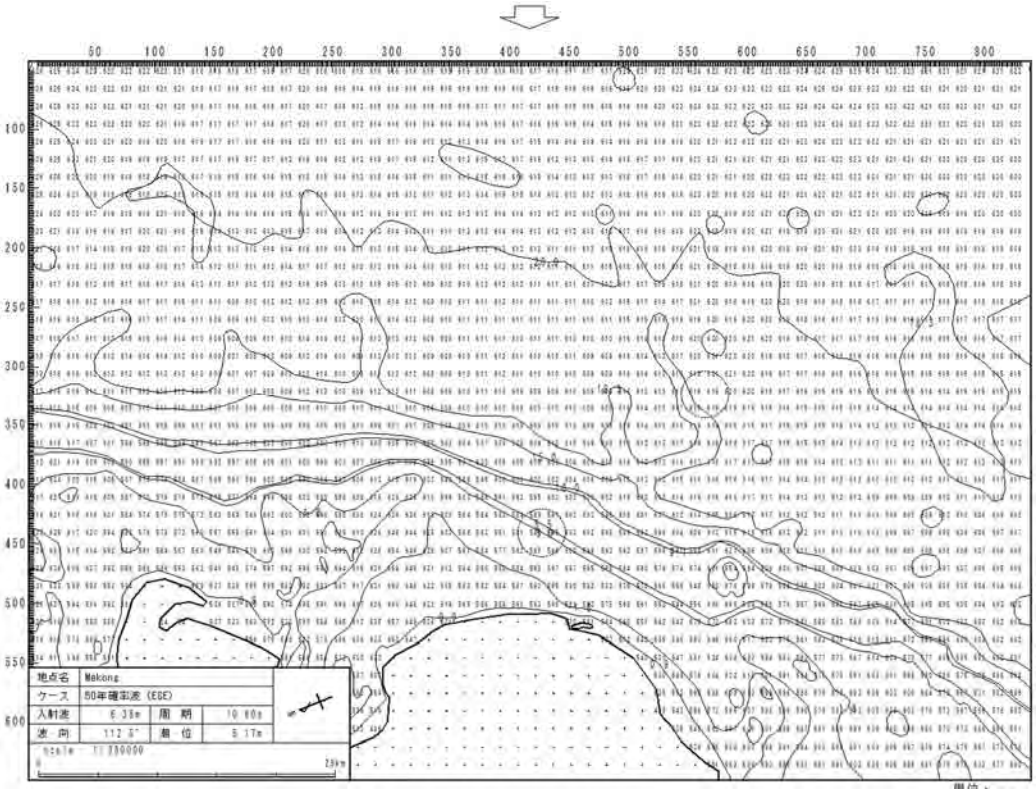


Figure C-6 The equivalent deepwater wave height (Direction of incident wave: ESE)

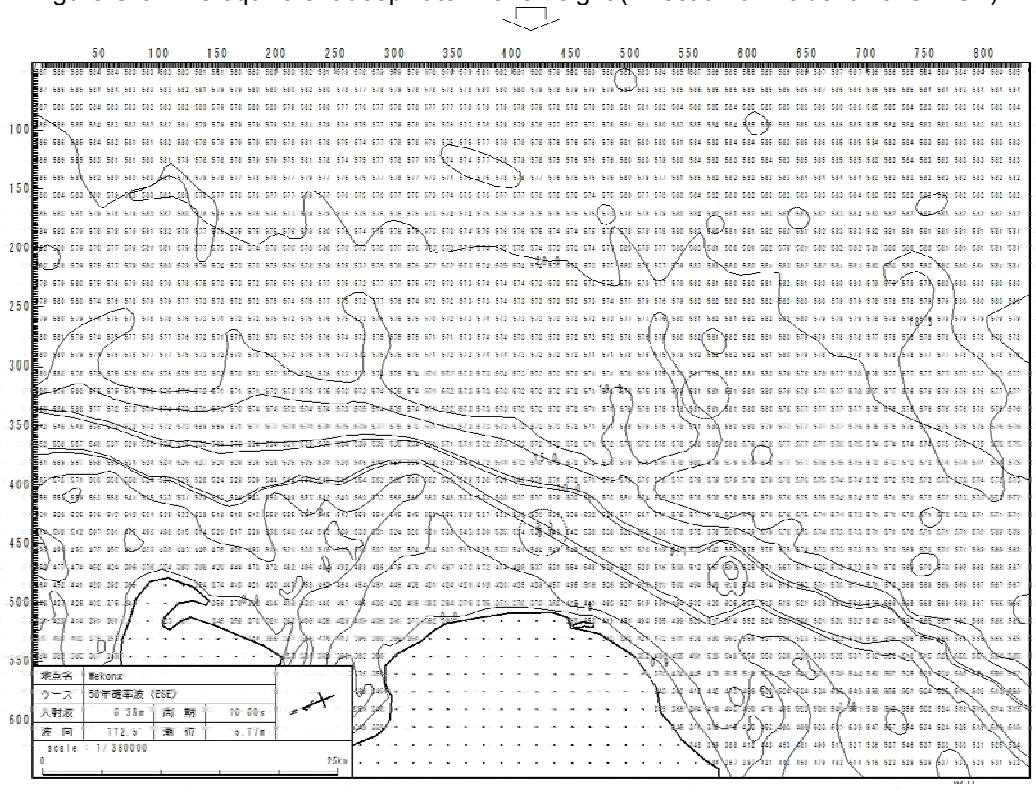


Figure C-7 The significant wave height (Direction of incident wave: ESE)

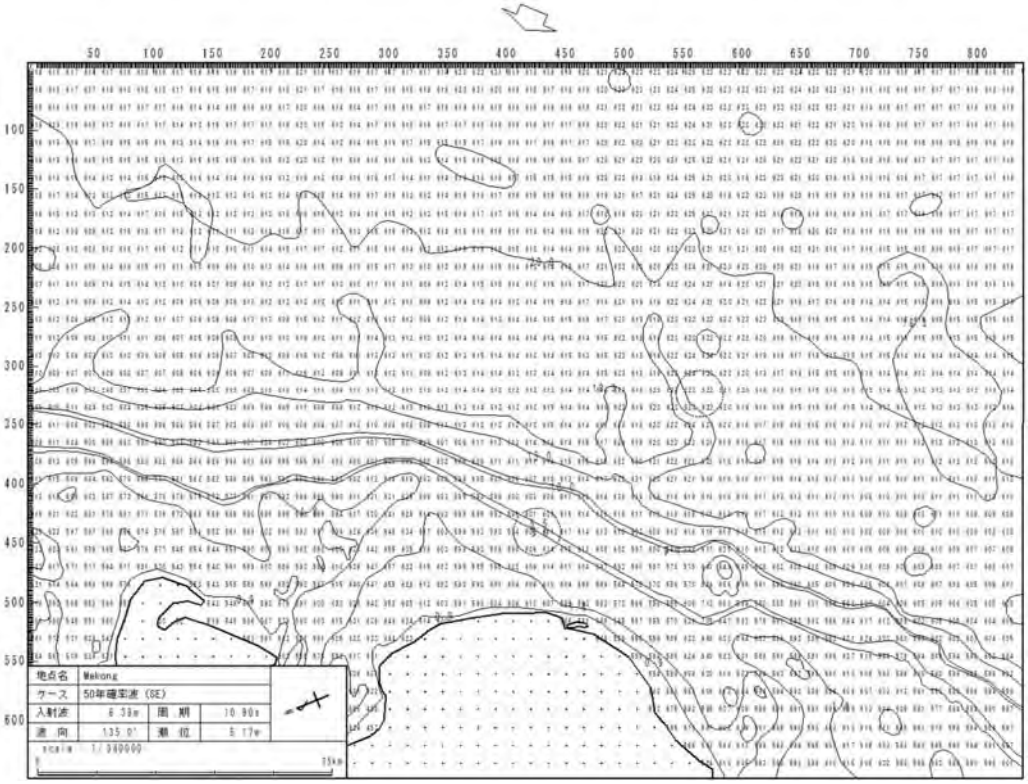


Figure C-8 The equivalent deepwater wave height (Direction of incident wave: SE)

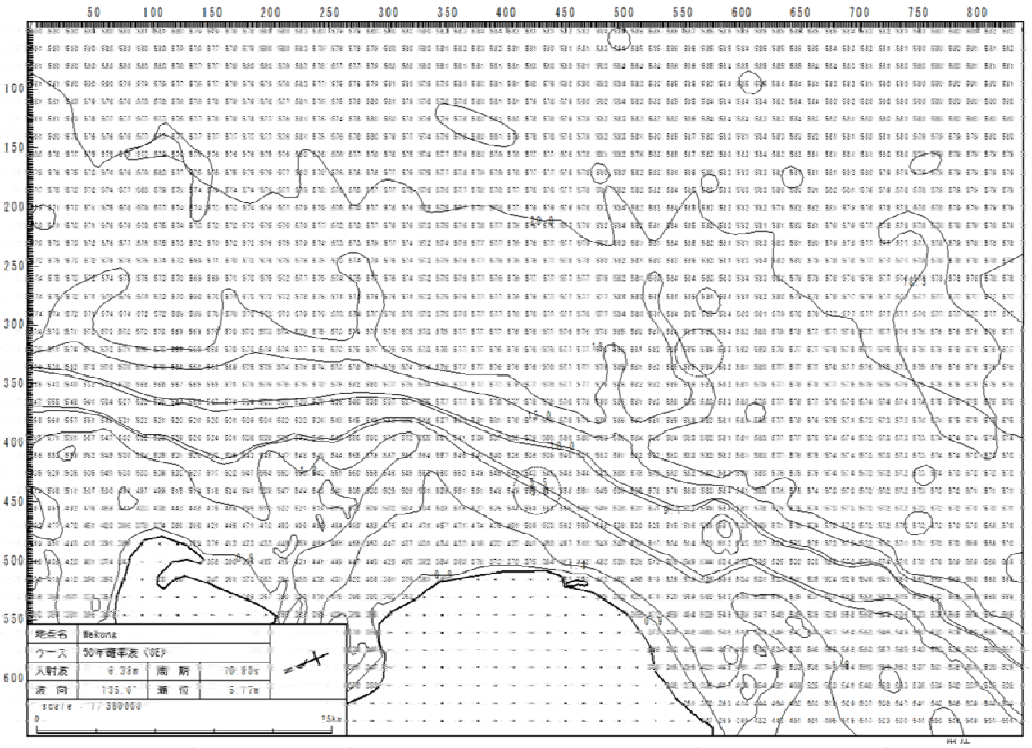


Figure C-9 The significant wave height (Direction of incident wave: SE)

Appendix-D

Study on candidate location (a) and (e) for coal stock yard

D1 The candidate site (a) and (e)

Tra Vinh Province PC had expressed their request about the selection of coal storage site at candidate site (a) and (e). JICA Study Team concluded by considering above issues that site (c) and (d) were the most appropriate site for coal storage and DF/R was complied based on this idea. Because the request by local government should be appreciated, site (a) and (e) were also considered as the candidate of coal storage yard and the results were given in this section.

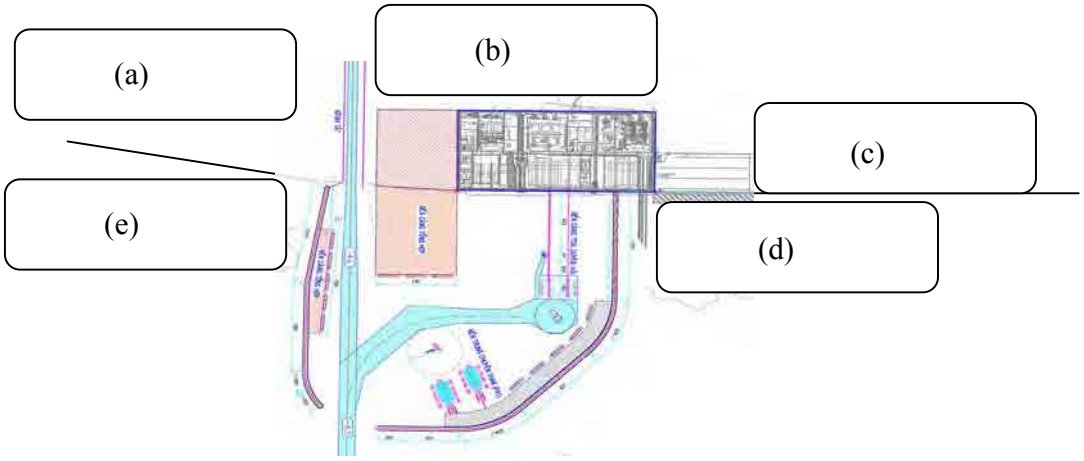


Figure D-1 Candidate location of coal stock yard

D2 Determination of Port and Terminal Layout Plan

As mentioned in section 5.2.3 (8), Location (a) and (e) had disadvantage about the coal transportation from unloading/loading berths to the candidate site due to the long distance transportation and necessity of crossing the channel and had low evaluation in coal storage site selection although other factors showed appropriate as shown above.

Construction of new port and imported coal unloading and loading berths at the other side of canal entrance was the possible idea to overcome these disadvantages. Construction and maintenance cost of coal transportation facilities and equipments could be reduced. But careful consideration of following issues is necessary.

- Construction cost will be increased because of the necessity of construction of new breakwater and additional channel and basin dredging and total project cost will significantly increase.
- Maintenance cost of coal transportation facilities and equipments can be less because of the short total length of these facilities.
- Secondary transportation of coal by barge are necessary for the coal supply to Duyen Hai CFPP that affect the total cost of coal for Duyen Hai CFPP.

D2.1 Conditions of Plan for Port and Terminal

Conditions of plan for port and terminal are same as section 5.2 and section 9.2. Estimated Coal handling volume is same as Scenario 1 shown in Section 5.2 and Scenario 2 shown in Section 9.2.

Table D-1 General conditions of plan for port and terminal
(coal stock yard: candidate site (a) and (e), coal demand: scenario 1)

				1st Phase	2nd Phase	3rd Phase
Conditions	Target period		Year	2020～	2025～	2030～
	Coal handling volume		Ton	8,530,000	17,800,000	31,090,000
	Coal transshipment volume		Ton	3,770,000	11,910,000	25,140,000
	Operation days per year		Day	350	350	350
	Working hours per day		Hour	18	18	18
	Calmness of the port		%	97.5	97.5	97.5
Unloading	Design vessel	Dead Weight Tonnage	DWT	70,000	100,000	160,000
	Unloader	Efficiency	%	75%	75%	75%
		Capacity	t/h	2,500	2,500	2,500
Loading	Design vessel	Dead weight tonnage	DWT	5000 ~10,000	5000 ~10,000	5000 ~10,000
	Ship loader	Efficiency	%	90%	90%	90%
		Capacity	t/h	1,500	1,500	1,500

Table D-2 General conditions of plan for port and terminal
(coal stock yard: candidate site (a) and (e), coal demand: scenario 2)

				1st Phase	2nd Phase	3rd Phase
Conditions	Target period		Year	2020～	2025～	2030～
	Coal handling volume		Ton	13,380,000	25,640,000	45,710,000
	Coal transshipment volume		Ton	6,690,000	18,950,000	39,020,000
	Operation days per year		Day	350	350	350
	Working hours per day		Hour	22	22	22
	Calmness of the port		%	97.5	97.5	97.5
Unloading	Design vessel	Dead Weight Tonnage	DWT	70,000	100,000	160,000
	Unloader	Efficiency	%	75%	75%	75%
		Capacity	t/h	2,700	2,700	2,700
Loading	Design vessel	Dead weight tonnage	DWT	5000 ~10,000	5000 ~10,000	5000 ~10,000
	Ship loader	Efficiency	%	90%	90%	90%
		Capacity	t/h	2,500	2,500	2,500

D2.2 Development plan of port and terminal facilities

The staged development plan for port and terminal planning is proposed as follows.

TableD-3 Facilities of port and terminal

				Phase1	Phase2	Phase3
Unloading	Design vessels	Dead weight tonnage	DWT	70,000 ～100,000	100,000	160,000

	Berth	Number	berth	2	3	4
		Length	m	300	300	350
		Water Depth	m	-16.0	-16.0	-19.0
	Channel	Water Depth	m	-14.5	-14.5	-17.5
		Width	m	200	200	225
	Turning basin	Water Depth	m	-16.0	-16.0	-19.0
	Handling equipment	Unloader	set	4	6	8
	Belt conveyor	Length	m	5,612	2,470	2,442
		Capacity	t/h	5,500	5,500	5,500
Loading	Design vessels	Dead weight tonnage	DWT	5,000	5,000	5,000
	Berth	Number	berth	2	4	7
		Length	m	160	160	160
		Water depth	m	-9.0	-9.0	-9.0
	Channel	Water depth	m	-7.5	-7.5	-7.5
		Width	m	150	150	150
	Turning basin	Water depth	m	-9.0	-9.0	-9.0
	Handling equipment	Ship loader	Set	2	4	7
	Belt conveyor	Length	m	4,112	258	3,740
		Capacity	t/h	3,300	3,300	3,300
Coal stock yard	Required area		Ha	22	40	72
	Stacker Reclaimer		Set	1	2	4
	Stacker (5500t/h)		Set	1	1	2
	Reclaimer (3000t/h)		Set	1	2	4
	Stock pile		Pile	2	6	12
	Length of stock pile		m	550	550	550
	Length of belt conveyor		m	4,092	2,716	5,380

TableD-4 Facilities of port and terminal

				Phase1	Phase2	Phase3
Unloading	Design vessels	Dead weight tonnage	DWT	70,000 ～100,000	100,000	160,000
	Berth	Number	berth	2	3	4
		Length	m	300	300	350
		Water Depth	m	-16.0	-16.0	-19.0
	Channel	Water Depth	m	-14.5	-14.5	-17.5
		Width	m	200	200	225
	Turning basin	Water Depth	m	-16.0	-16.0	-19.0
	Handling equipment	Unloader	set	4	6	8
	Belt conveyor	Length	m	5,612	2,470	2,442
		Capacity	t/h	5,500	5,500	5,500

Loading	Design vessels	Dead weight tonnage	DWT	5,000	5,000	5,000
	Berth	Number	berth	2	5	8
		Length	m	160	160	160
		Water depth	m	-9.5	-9.5	-9.5
	Channel	Water depth	m	-7.5	-7.5	-7.5
		Width	m	150	150	150
	Turning basin	Water depth	m	-9.0	-9.0	-9.0
	Handling equipment	Ship loader	Set	2	4	7
	Belt conveyor	Length	M	4,112	1,780	2,218
		Capacity	t/h	5,500	5,500	5,500
Coal stock yard	Required area		Ha	35	60	108
	Stacker Reclaimer		Set	3	5	10
	Stock pile		Pile	2	6	12
	Length of stock pile		m	900	900	900
	Length of belt conveyor		m	5,842	3,766	7,480

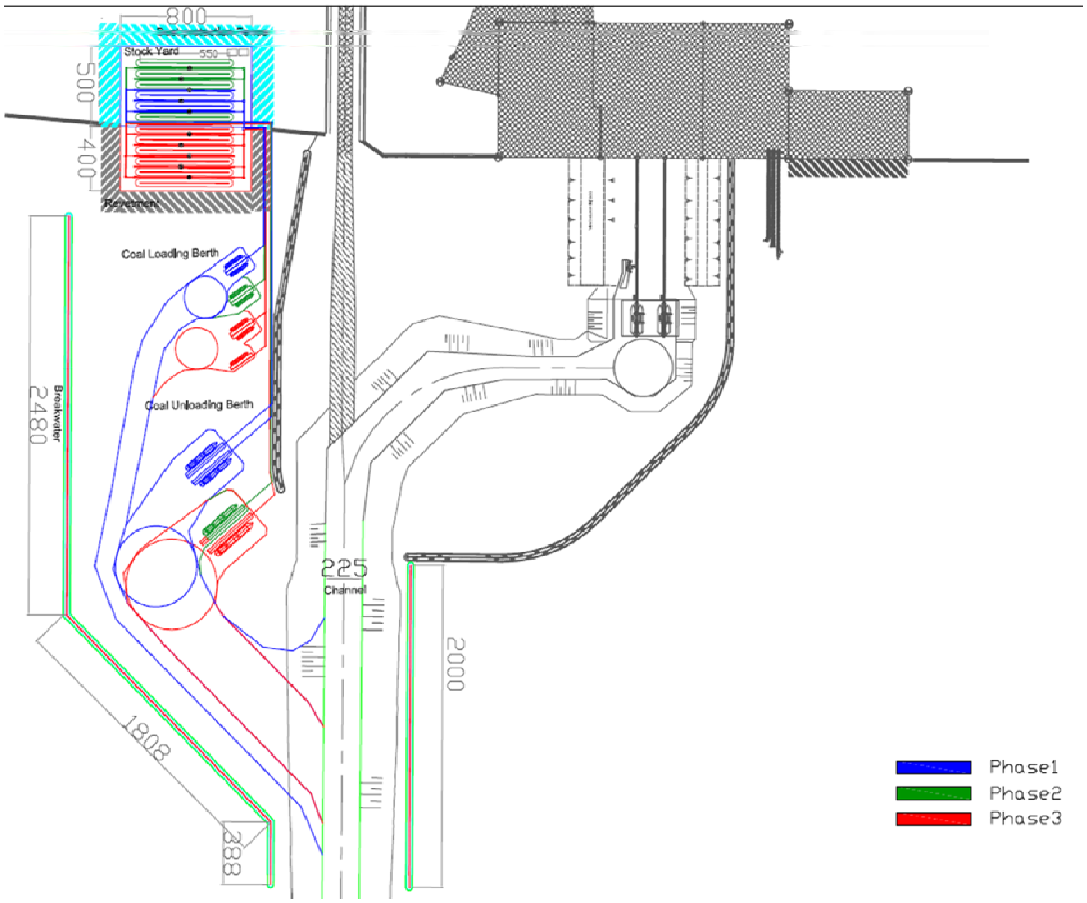


Figure D-2 Layout of Port and Terminal Planning

D3 Project Cost Estimation Scinario-1 AE

D3.1 General Description

Same general condition as described in the Section 7.1.1 and the Section 11.1.1 will be applied to estimate project cost.

D3.2 Construction Cost

Construction cost will be estimated by the same procedure as the Section 7.1.2 and the Section 11.1.2.

(1) Quantity of Facilities

When AE area is applied for the coal storage yard, quantities of facilities are changed. Facility name, quantity and outline of the Work Items, the coal handling equipments to be installed and buildings to be constructed in the Coal Transshipment Terminal to be executed in accordance with each stage are summarized in the Table D-5, the Table D-6 and the Table D-7.

Table D-5 Outline of the Facilities to be constructed

No.	Facility's Name	Unit	Quantity (Scenario1)			Quantity (Scenario2)		
			Initial stage	2nd stage	3rd stage	Initial stage	2nd stage	3rd stage
1	Construction of the Coal Unloading Berth	Berth	2	3	4	2	3	4
2	Construction of the Coal Loading Berth	Berth	2	4	7	2	5	8
3	Earth Work of the Coal Storage Yard	ha	22	40	72	35	60	108
4	Revetment	m	2,000	3,400	5,000	2,900	4,600	6,600
5	Dredging and Disposal Works	mil.m3	26	28	48	26	28	48
6	Channel Protection Work	km	6.5	6.5	6.5	6.5	6.5	6.5

Table D-6 Outline of the Coal Handling Equipment to be installed

No.	Facility's Name	Unit	Quantity (Scenario1)			Quantity (Scenario2)		
			Initial stage	2nd stage	3rd stage	Initial stage	2nd stage	3rd stage
1	Coal unloaded machine	Set	4	6	8	4	6	8
2	Coal loading machine	Set	2	4	7	2	5	8
3	Stacker Reclaimer	Set	3	5	10	3	5	10
4	Belt Conveyor	Km	14	19	31	16	23	35

Table D-7 Outline of the Buildings to be constructed

No.	Facility's Name	Unit	Quantity (Scenario1)			Quantity (Scenario2)		
			Initial stage	2nd stage	3rd stage	Initial stage	2nd stage	3rd stage
1	Administration Building	L.S	1	1	2	1	1	2
2	Maintenance House	L.S	1	1	2	1	1	2
3	Sub-Station	L.S	1	1	2	1	1	2
4	Wind Protection Wall	km	1.8	1.8	1.8	3.4	3.4	5.4
5	Security Fence	Km	2.6	2.6	4.2	3.4	3.4	5.0

(2) Work Quantity of each facility

Required work quantities of each facility based on the preliminary design of the first phase are same as the Section 7.1.2 and Section11.1.2.

(3) Unit price of the work

The same unit prices as the Section 7.1.2 and Section 11.1.2 will be applied for the estimation of the construction cost.

(4) Construction cost

Construction cost is estimated based on the above work quantities and unit prices.

1) Direct Cost

Direct cost calculated from the work quantities and unit prices are shown in the Table A-8 and A-9.

Table D-8 Direct Cost (Scenario1)

This information includes trade secrets.

Table D-9 Direct Cost (Scenario2)

This information includes trade secrets.

2) Indirect Cost

Indirect cost consists of common temporary cost and site management cost. The common temporary cost shows costs of temporary works, fence and gate, access road, common equipment, etc. And the site management cost shows cost of management staff, office operation, accommodation, transportation, etc.

According to experience by the study team in South-East Asia, 4.3% of direct cost will be applied to the common temporary cost and 13.7% of direct cost will be applied to the site management cost in this study.

3) General Cost

General cost shows cost of headquarter and/or branch of the contractor. According to experience by the study team in South-East Asia, 9.4% of direct cost will be applied to the general cost in this study.

4) Contingency

15% of the total of the direct cost, indirect cost and general cost are applied.

5) Tax

10% of the total of the direct cost, indirect cost, general cost and contingency are applied to necessary Tax

6) Estimated Construction Cost

Estimated construction cost including direct cost, indirect, general cost, contingency and Tax is shown in Table D-10 and D-11.

TableD-10 Estimated Construction Cost (Scenario1)

This information includes trade secrets.

Table D-11 Estimated Construction Cost (Scenario2)

This information includes trade secrets.

D3.3 Maintenance and Operation Cost

Maintenance and operation cost which are occurred after commencement of the operation will be estimated in this Section. This cost will be shown as an annual cost of each stage of the project.

(1) Work item and quantity

Maintenance and operation cost of this project may be divided into following five items. Explanation, quantity, unit price and annual cost of each item will be estimated below.

1) Maintenance Dredging

According to the result of the simulation study, expected monthly maintenance dredging volume and necessary cost are calculated. Summary of the maintenance dredging volume and cost is shown in the Table D-12.

Table D-12 Summary of the Maintenance Dredging

This information includes trade secrets.

2) Maintenance of the constructed facilities

Expected annual maintenance cost of the civil constructed facilities is calculated as 0.5% of construction cost except Dredging works. Calculated maintenance cost of the construction facilities are shown in the TableD-13.

Table D-13 Maintenance Cost of the constructed facilities

This information includes trade secrets.

3) Maintenance of the Coal Handling Equipments

Expected annual maintenance cost of the Coal Handling Equipments is calculated as 3.0% of the purchased cost. Calculated maintenance cost of the Coal Handling Equipments is shown in the TableD-14.

Table D-14 Maintenance Cost of the Coal Handling Equipments

This information includes trade secrets.

4) Operation Cost

Expected annual Operation cost is shown in the Table D-15.

Table D-15 Operation Cost

This information includes trade secrets.

(2) Estimated Maintenance Cost

Estimated maintenance cost of each stage is shown in Table D-16 and D-17. These costs include related tax

Table D-16 Summary of the Maintenance Cost (Scenario1)

This information includes trade secrets.

Table D-17 Summary of the Maintenance Cost (Scenario2)

This information includes trade secrets.

D3.4 Consulting Service Fee

Consultant service consists of design work and construction supervision work. According to current records of similar construction projects in North and South Vietnam, 15million USD will be applied to the design cost and 15million USD will be applied to the construction supervision cost for the initial stage, 5million USD will be applied to the design cost and 5million USD will be applied to the construction supervision cost for the 2nd stage, and 10million USD will be applied to the design cost and 10million USD will be applied to the construction supervision cost for the third stage, in this study.

D3.5 Project Cost

Summary of the Project Cost estimated in this Section is shown in Table D-18 and Table D-19.

Table D-18 Estimated Project Cost in Scenario1

This information includes trade secrets.

Table D-19 Estimated Project Cost in Scenario2

This information includes trade secrets.

Appendix-E

Environmental Check List

1) Coal stock yard

2) Port facility

Evaluation in accordance with JICA Environmental Check List(Coal Stock Yard)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process?	(a)N	(a) EIA report has not prepared yet at present. It will be prepared after IPR(Investment Project Report) is approved, budget is secured, and implementing body is appointed.
		(b) Have EIA reports been approved by authorities of the host country's government?	(b)N	(b)Development plan for the power plant area is already approved by the Government. The EIA report for the following project is already approved. 1） Duen Hai Thermal power plant project 2） Haw River Bypass Canal project 3） Port project for Duen Hai Thermal power plant
		(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	(c)-	(c)EIA reports has not been prepared yet (as of September 2014)
		(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(d)Y	(d) Development plan for Duen Hai area is approved by the Government and construction for thermal power plant, port and bypass canal is initiated. Approval processes except EIA are planned to be proceeded in accordance with progress of JICA's feasibility study.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders?	(a)-	(a)People's committee plans to conduct stakeholder meetings based on Vietnamese procedures. The schedule of local stakeholder meetings has not been fixed. In accordance with Law on Environmental Protection Article 20 and Circular No. 08/2006/TT-BTNMT 3.2 for detail, stakeholder's comments will be reflected to EIA report. The project will be implemented based on EIA report.
		(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(b)-	(b) Comments from stakeholders shall be reflected to EIA report. Details such as schedule, number of participants, and handouts are recommended to describe in EIA report. At the stage of construction and operation, project owner (VINACOMIN) needs

<table>
<tr><th>Category</th><th>Environmental Item</th><th>Main Check Items</th><th>Yes: Y
No: N</th><th>Confirmation of Environmental Considerations
(Reasons, Mitigation Measures)</th></tr>
<tr><td></td><td></td><td></td><td></td><td>to confirm the contents described in EIA report.</td></tr>
<tr><td></td><td>(3) Examination of Alternatives</td><td>(a) Have alternative plans of the project been examined with social and environmental considerations?</td><td>(a)Y</td><td>(a) The project is to construct a coal terminal which is for supplying coals to several thermal power plants located in the south of Vietnam. Several alternatives are planned such as layout of piers and structures. Also, Five alternative options (A,B,C,D,E) for coal stock yard are studied.
EIA reports is planned to be prepared based on the guideline of MONRE. Summary of evaluation of alternative options are described in Main report Chapter 18, 14.11.</td></tr>
<tr><td>2 Pollution Control</td><td>(1) Air Quality</td><td>(a) Do air pollutants, such as sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust emitted by the power plant operations comply with the country’s emission standards? Is there a possibility that air pollutants emitted from the project will cause areas that do not comply with the country’s ambient air quality standards? Are any mitigating measures taken?</td><td>(a)Y</td><td>(a) It is necessary that air pollution at the operation stage of coal terminal meet the level of QCVN standard. So that for the countermeasures at dry season, dust prevention fence and buffer zone with planting trees are introduced as coal dust prevention.
<Vietnam’s standard: QCVN 05- 2013-BTNMT>
<table><tr><th>Items</th><th>Average per hour</th><th>Average per 8 hours</th><th>Average per 24 hours</th><th>Annual average</th></tr><tr><td>SO2</td><td>350</td><td>-</td><td>125</td><td>50</td></tr><tr><td>CO</td><td>30000</td><td>10000</td><td>5000</td><td>-</td></tr><tr><td>NOx</td><td>200</td><td>-</td><td>100</td><td>40</td></tr><tr><td>O3</td><td>180</td><td>120</td><td>80</td><td>-</td></tr><tr><td>TSP</td><td>300</td><td>-</td><td>200</td><td>140</td></tr><tr><td>PM10</td><td>-</td><td>-</td><td>150</td><td>50</td></tr><tr><td>Pb</td><td>-</td><td>-</td><td>1.5</td><td>0.5</td></tr></table></td></tr>
<tr><td></td><td></td><td>(b) In the case of coal-fired power plants, is there a possibility that fugitive dust from the coal piles, coal handling facilities, and dust from the coal ash disposal sites will cause air pollution? Are adequate measures taken to prevent the air pollution?</td><td>(b)Y</td><td>(b)It is proposed to consider the following facilities at the stage of design in order to minimize environmental impact by dust from coal stock yard and conveyance system at dry season.
- dust prevention fence
- dust prevention roof of belt conveyers
- concrete or asphalt paving (in the area of operation facilities)
- collection system of surface water including sedimentation pond</td></tr>
</table>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(2) Water Quality	(a) Do effluents including thermal effluents from the power plant comply with the country's effluent standards? Is there a possibility that the effluents from the project will cause areas that do not comply with the country's ambient water quality standards or cause any significant temperature rise in the receiving waters?	(a)-	(a)No applicable
		(b) In the case of coal-fired power plants, do leachates from the coal piles and coal ash disposal sites comply with the country's effluent standards?	(b)Y	(b)Since surface water from coal stock yard includes powdered coal, it is collected by sedimentation pond and surface water collection system. Collected powdered coal is reused as fuel coal after it is dried.
		(c) Are adequate measures taken to prevent contamination of surface water, soil, groundwater, and seawater by the effluents?	(c)Y	(c) Discharged water to sea is regulated by Vietnam environment criteria（QCVN08, 2008/BTNMT） and water quality criteria(QCVN10, 2008/BTNMT). As for powdered coal, sedimentation pond is set for collection of powdered coal. The belt conveyer for coal transportation is considered to prevent scatter of coal with roof. The unloading equipment from large-scale ship is considered to adapt equipment with prevent scatter.
	(3) Wastes	(a) Are wastes, (such as waste oils, and waste chemical agents), coal ash, and by-product gypsum from flue gas desulfurization generated by the power plant operations properly treated and disposed of in accordance with the country's regulations?	(a)-	(a) No applicable Since the plant is an intermediate port of coal, wastes except domestic waste are not expected. Wastes at construction stage are estimated as wastes from worker's accommodation and construction and it is treated by setting waste bins and conducting of monitoring.
	(4) Noise and Vibration	(a) Do noise and vibrations comply with the country's standards?	(a)Y	(a)The noise level needs to be under the allowed level of QCVN26-2010/BTNMT, 75dBA. The residential area is more than 200 m far from the construction area and the impact of noise and vibration are less. Main sources of noise are as follows. - 110 dB at the point of 15m from pile driver - 90dB at the point of 15m from bulldozer

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				Transport of construction materials and equipment are conducted by sea traffics. A part of materials and equipments are transported by vehicles through the main road which is used by local residents for daily life and might cause possibility of impact of noise and vibration but the impact is limited.
	(5) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a)N	(a)The project does not plan pump up of underground water.
	(6) Odor	(a) Are there any odor sources? Are adequate odor control measures taken?	(a)Y	(a)No odor is expected. However, it is planned to set buffer zone with planting trees around the coal stock yard.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a)N	(a)The proposed project area is not within the preservation area designated by national and international laws.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Is there a possibility that the amount of water (e.g., surface water, groundwater) used by the project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on	(a)N (b)N (c)Y (d)Y	(a) There are many mangroves around the proposed project area but it does not include important habitats. The stock yard is planned to be constructed beside of power plant area which is under construction. The unloading facilities will be constructed inside of the existing port for power plant which is planned as multi- purpose port. (b)The proposed project site (unloading facilities and coal stock yard) does not include habitats of rare species protected by national or international laws. (c) There is mangrove forest near the project site but no habitats for rare species within the project site. The stock yard is planned to be constructed considering the minimum impact on existing mangrove forest and serious impact on ecosystem is not expected. There is no serious issue. (d) Surface water is processed by surface water collection system and sedimentation pond and will be discharged to sea, impact on

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		aquatic environments, such as aquatic organisms?		aquatic organism is expected to be minimum. However, it is necessary quantitative check of the impact by monitoring at operation stage.
		(e) Is there a possibility that discharge of thermal effluents, intake of a large volume of cooling water or discharge of leachates will adversely affect the ecosystem of surrounding water areas?	(e)-	(e) No applicable
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	(a)Y	(a) The coal stock yard（22ha：Phase I） is planned to be set in or next to the site of power plant which is under construction. The resettlement for power plant has been completed three years ago. In the proposed additional site for coal stock yard, approx. 20 families have requested resettlement at final stage (Phase 3: 72ha) . The resettlement and land acquisition for the additional site will be conducted based on Vietnam relevant laws by Peoples' committee (PC).
		(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?	(b)Y	(b)As for the coal power plant project, PC conducted meeting with residents and compensation for resettlement was already completed compensation to the affected people according to the conditions such as land, kind of building, property, cemetery, support to resettlement. The same kind of procedure needs to be conducted for the project of coal storage yard.
		(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?	(c) Y	(c) The same kind of procedure needs to be conducted for the project of coal storage yard.
		(d) Are the compensations going to be paid prior to the resettlement?	(d) Y	(d) The same kind of procedure needs to be conducted for the project of coal storage yard.
		(e) Are the compensation policies prepared in document?	(e) Y	(e) The same kind of procedure needs to be conducted for the project of coal storage yard.

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		(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	(f)- Y	(f) The same kind of procedure needs to be conducted for the project of coal storage yard. There is no minority in the proposed site. The major profession of residents is fishery and agriculture.
		(g) Are agreements with the affected people obtained prior to resettlement?	(g)Y	(g) The same kind of procedure needs to be conducted for the project of coal storage yard.
		(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	(h) Y	(h) The same kind of procedure needs to be conducted for the project of coal storage yard.
		(i) Are any plans developed to monitor the impacts of resettlement?	(i) Y	(i) The same kind of procedure needs to be conducted for the project of coal storage yard.
		(j) Is the grievance redress mechanism established?	(j) Y	(j) The same kind of procedure needs to be conducted for the project of coal storage yard. PC is responsible organization based on Vietnamese laws.
	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?	(a)Y	(a) The unloading facilities are constructed inside of the port which is under construction. As for the countermeasures of environment, following facilities are planned: - dust prevention fence - dust prevention roof of belt conveyers - concrete or asphalt paving (in the area of operation facilities) - collection system of surface water including sedimentation pond Transporting coal is conducted by ships and it gives less impact at the operation stage. Also transporting major construction equipment and materials will be conducted by ships and gives less impact. The mitigation plan for environmental impact is described in the main report of Chapter 18 14.9.
		(b) Is sufficient infrastructure (e.g., hospitals, schools, and roads) available for the project implementation? If	(b)Y	(b)There are housings, shops, and small scale factories along the access road to the project site. The access road is paved and in

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		the existing infrastructure is insufficient, are any plans developed to construct new infrastructure or improve the existing infrastructure?		good condition. There are public facilities such as schools and a clinic near the project site. In the power plant project, school was constructed in the resettlement area.
		(c) Is there a possibility that large vehicles traffic for transportation of materials, such as raw materials and products will have impacts on traffic in the surrounding areas, impede the movement of inhabitants, and any cause risks to pedestrians?	(c)Y	(c) The multi- purpose port for power plant is under construction presently. Transportation of construction materials is planned by sea traffic. A part of the construction materials for coal stock yard utilizes vehicles. Transport of construction materials and equipment are planned by sea traffics. A part of materials and equipments are transported by vehicles and might cause possibility of impact of noise, vibration and exhaust gas but the impact is limited only during construction stage.
		(d) Is there a possibility that diseases, including infectious diseases, such as HIV, will be brought due to the immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?	(d)Y	(d)Almost 1,000 workers will be hired at peak time. It is necessary to conduct health care program such as anti-infection to workers. These programs need to be clearly mentioned on the contract with workers.
		(e) Is there a possibility that the amount of water used (e.g., surface water, groundwater) and discharge of thermal effluents by the project will adversely affect existing water uses and uses of water areas (especially fishery)?	(e)N	(e) Medium scale ships with engine engage fishery in the different area, so there is no impact on its activity. However, it is necessary to care several families which carry out small scale fishing at ponds and coastal area.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a)N	(a)There is no archeological, historical, cultural and religious heritage in the site.

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	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a)Y	(a) The project site is not designated as national park and preservation area. The height of coal stock yard planned to be almost 15.5m high and it might be unusual landscape at its operation. The site is, however, remote area and next to power plant, so the impact on the landscape is minimum. Also it is planned to set buffer zone around the coal stock yard.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	(a)N	(a) There are no ethnic minorities and indigenous people.
		(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(b)Y	(b) There is no issue regarding their right.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	(a)Y	(a)It is necessary for workers to observe Vietnamese laws.
		(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	(b)Y	(b)As for hazardous wastes, it is necessary to contract with waste management company. It is proposed to prepare manual and safety guideline for treatment of hazardous wastes.
		(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?	(c)Y	(c)At the construction stage, it is proposed to provide lectures for workers' health and safety. It is necessary that the contractor shall carry out work based on the contract as duties.
		(d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(d)-	(d)It is proposed to provide lectures for safety program to security guards in order not to violate residents and project workers.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impact during construction	(a) Is there any mitigation plan for pollution such as noise, vibration, waste water, dust, effluent gas, and wastes during construction?	(a)-	(a)Mitigation and monitoring plan will be reviewed in EIA report. The mitigation plans is described in the report of Chapter 18 14.9.
		(b)Is there any impact on natural environment or any mitigation plan?	(b)Y	(b) Mitigation and monitoring plan will be reviewed in EIA report. At the construction stage, it is proposed to prepare environmental management plan for studying negative impact. Mitigation plan will be confirmed by that.
		(c) Is there any impact on social environment by construction or any mitigation plan?	(c)Y	(c) Mitigation plan and monitoring plan shall be reviewed in EIA report. It is recommended to prepare environmental management plan to survey negative impact at construction stage.
	(2) Accident prevention	(a) In case of coal power plant, is there any prevention plan for autogenous ignition at coal stock yard?	(a)Y	(a)It is proposed to make a mitigation plan based on international standards and Japanese experiences in order to prevent spontaneous combustion of coal, and prepare manuals for prevention at operation stage.
	(3)Monitoring	(a) Is there any monitoring plan and implementation plan by project owners as for above environmental issues?	(a)Y	(a) The environmental monitoring plan shall be checked in EIA report and detailed monitoring plan shall be prepared based on approved EIA report at construction stage. Mitigation plan and monitoring plan are indicated in FS report, Chapter18.14.9 and 18.10.10.
		(b) How are items, countermeasures, and frequency set in the monitoring plan?	(b)Y	(b) The information descried in the left column is indicated in FS report and detailed monitoring programs are prepared based on approved EIA report at construction stage.
		(c) Is the monitoring system set up such as organization, staffs, equipments, and budget?	(c)Y	(c) The information descried in the left column is proposed to be reviewed in the environmental management plan which is prepared at later stage.
		(d) Is the method and frequency of report from the project owner to relevant organizations fixed?	(d)Y	(d) It is described in monitoring plan of FS report. Monitoring plan is prepared based on approved EIA report at construction stage. It is necessary to describe detailed method and frequency of monitoring at construction and operation stages in environmental

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
				monitoring plan.
6 Notes	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of electric transmission lines and/or electric distribution facilities). (b) Where necessary, pertinent items described in the Ports and Harbors checklist should also be checked (e.g., projects including construction of port and harbor facilities).	(a)- (b)Y	(a) Not applicable (b) Please refer “Port Check List” for evaluation of port facility.
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, and global warming).	(a)N	(a) There are no description in EIA report, but since this item is essential for evaluation of the project, it is recommended to study the impacts to transboundary or global issues after completion of the detailed design work and after selection of main facilities of power plant.

Evaluation based on JICA Environmental Check List（**Port Facility**）

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1. Pollution Control	(1) Water Quality	(a) Do effluents from the project facilities comply with the country's effluent and environmental standards?	(a) Y	(a) There are no oil disposal facility at pier and port and bilge discharged from ships are treated at maintenance doc. Domestic waste water by workers is planned to dispose sewage treatment plant before discharged into sea. Waste water into sea needs to oblige Vietnamese environmental regulation such as QCVN08, 2008/BTNMT and water quality regulation such as QCVN10, 2008/BTNMT. Surface water of coal stock yard will be discharged into sea after powdered coals are removed at sedimentation tank.
		(b) Does the project prepare any measures to prevent leakages of oils and toxicants?	(b)Y	(b)Hazardous materials are treated based on regulation. It is necessary to purchase oil fence or absorbed mat as countermeasure of oil leakage since power plant terminal is used for multi- purpose terminal. As for risk countermeasure, it is proposed to prepare operation manual considering environment.
		(c) Does the project cause any alterations in coastal lines and disappearance/appearance of surface water to change water temperature or quality by decrease of water exchange or changes in flow regimes?	(c)Y	(c)The change of waterfront line is anticipated since following large scale land reclamation and constructions are planned. ● Construction of piers on ocean ● Landfill at coal stock yard ● Dredging of access channels of ships ● Construction of coal stock yard To avoid sand accumulation in access channels of ships, it is proposed to conduct simulation to minimize accumulation of sand at design stage.
		(d) Does the project prepare any measures to prevent polluting surface, sea or underground water by the penetration from reclaimed lands?	(d) Y	(d) Soils for the land reclamation planned utilize river soils from neighboring rivers. Spilled water from landfill site need to be disposed properly for countermeasure of environmental conservation. For the countermeasure of pollution, it is proposed to conduct following studies at construction stage. (At

				present, turbidity of water quality is high because of soil erosion.) ● Analysis of soil ● Study of landfill method ● Study of spilled water treatment method ● Mitigation of water pollution
	(2) Wastes	(a) Are wastes generated from the ships and other project facilities properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a)Wastes from ships are treated based on International Law （Marpol73/78treaty）, port regulation, and Vietnamese regulations. Port facility does not have any oil treatment facility, so bilge of ships are treated at maintenance dock. Therefore, bilge and waste from ships do not affect on surrounding environment.
		(b) Is offshore dumping of dredged soil properly disposed in accordance with the country's regulations?	(b) Y	(b) Dredged soils of access channel are disposed designated place in the sea according to the Vietnamese regulations. Monitoring of sea water quality is conducted during dredging and disposal of soils based on environmental monitoring plan which is prepared at construction stage, and confirm the conditions of pollution.
		(c) Does the project prepare any measures to avoid dumping or discharge toxicants?	(c) Y	(c)It is expected that generated hazardous materials at port facility and coal stock yard will be bilges and powdered coal which is flow out with surface water, but is limited conditions. These substance that cause pollution are treated at collection system of surface water, sedimentation pond and sewage disposal plant properly, so there is less impact on environment. It is proposed to contract with professional companies on treatment of other hazardous materials.
	(3) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a) Y	(a) The operation of port obeys Vietnamese environmental regulation such as QCVN26、2010/BTNMT and QCVN27、2010/BTNMT. The source of noise at construction stage is construction equipments, transporter vehicle, and ships. Construction site is located in sea and seashore where is far from residential area, so the impact of noise is less.
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) Y	(a) Hazardous materials from ships are treated at maintenance dock based on government ‘s laws. Equipment for loading and unloading of coal from ships is selected considering prevention

				scatter of coals. Also it is planned to prevent scatter of coals by setting roofs over belt conveyer. The test results of seabed sediment which were collected showed that the concentration of heavy metals in the sediment in the Port area did not exceed the critical values (in comparison with Dutch and Australian standards) for bottom sediment quality). In comparison with Vietnamese regulation for concentration of heavy metal in soil for industrial land (QCVN 03:2008/BTNMT), the concentration of heavy metals did not exceed the critical values.
2.Natural Environment	(1) Hydrology	(a) Do the project facilities affect adversely flow regimes, waves, tides, currents of rivers and etc if the project facilities are constructed on/by the seas?	(a) N	(a) Coal terminal is planned to construct inside of the existing port, and coal stock yard are planned coastal area beside of power plant. As this project including land reclamation but there is no serious negative impact on stream regime, ocean waves, and tidal stream.
	(2) Topography and Geology	(a) Does the project require any large scale changes of topographic/geographic features or cause disappearance of the natural seashore?	(a) Y	(a) The project includes large scale land reclamations. Necessary soils for landfill are utilized river bed soils taken from neighboring rivers. There is no possibility of large scale changes of topographic/geographic features or cause disappearance of the natural seashore. However, it is necessary to consider the planning with a careful manner.
	(3) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? (b) Is there a possibility that changes in water uses (including fisheries and recreational uses) in the surrounding areas due to project will adversely affect the livelihoods of inhabitants?	(a) Y (b) Y	(a) There is no serious negative impact on residents expected by the project. A part of materials and equipments are transported by vehicles and might cause possibility of impact of noise, vibration and exhaust gas but the impact is limited during construction stage. (b)There is swimming beach at 5km north of proposed project site. The area is not used presently because of high turbidity caused by high sea and erosion of seashore, but consideration on environment is necessary. The fishing ground where conducting fishing operation by middle size ships with engine is different from the project site. There is less possibility that construction of port facility affect fishery, but it is necessary to consider several families who

		(c) Is there a possibility that port and harbor facilities will adversely affect the existing water traffic and road traffic in the surrounding areas?	(c) Y	carry out small scale fishing in coastal area and pond. (c) Traffic in the sea might be increased by increase of number of ships in the future but the impact is expected to be less.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) Y	(a) The construction of piers and transport facility to the land will not affect landscape. The height of coal stock yard is planned to be 15.5 m high, which might be unusual landscape at operation. The proposed area is remote area and next to the existing power plant, so it will not affect landscape at large degree. Tree planting around coal stock yard is planned as a buffer zone.