# Chapter 1
# Introduction

## 1.1 Background and rationale of the project

### 1.1.1 Background of U-Tapao Airport

U-Tapao International Airport is located in Phala Subdistrict, Ban Chang District, Rayong Province, about 35 kilometers west of Rayong city, and about 30 kilometers south of downtown Pattaya. The airport, covering an area of approximately 12,689 rai, is under the Royal Thai Navy. Construction of the U-Tapao Airport took place in 1961 when the Navy needed a naval air base. A land survey was conducted and the area was identified. The Supreme Command approved the construction of the airport with a 1,200-meter asphalt runway in U-Tapao village in Rayong Province. In 1962, with the threat of communism in South Vietnam and Laos, endangering the entire Indochina, the United States and Thai governments decided to build an additional major air base in Thailand, leading to the expansion of U-Tapao Airport when the Thai Cabinet resolved in 1965 to approve the airport expansion. The airport was used as a joint military transportation hub for US-led war in Vietnam and for Thai military fighting communist insurgencies in different parts of the country. Subsequently, then-supreme command, Field Marshal [redacted] assigned the Navy to take charge of the airport and officially named it “U-Tapao “Airport.”

In 1976, following the withdrawal of US troops from Thailand, including those stationed at the U-Tapao Airport, the Thai Cabinet decided to convert the U-Tapao Airport into a secondary international commercial airport to complement the Don Mueang Airport. The Ministerial Regulation No. 68 (1976) was issued under the provisions of the Customs Act 1926, designating the U-Tapao Airport in Rayong Province as a customs airport to handle international commercial flights and as an import-export hub. The ministerial regulation went into effect when it was published in the Government Gazette Special Edition, Volume 93, Section 90, on 9 July 1976.

The Cabinet resolved on 21 February 1989 to designate the Navy to jointly operate the U-Tapao Airport with the Department of Commercial Aviation. The RTN was tasked with finance and accounts, building maintenance and inventories, security, air-ground communications, air traffic control and aviation auxiliary equipment, while the Department of Commercial Aviation was assigned to handle aviation protocols, airport development and advisory work as proposed by the Ministry of Defence.

The Ministry of Defense issued a Ministry of Defence (specific) directive No. 30/33 Re: the appointment of the U-Tapao Airport Executive Committee, and on 31 October 1996, the RTN approved the establishment of the U-Tapao Airport Division (for the purpose) of preparing personnel for the conversion of U-Tapao Airport into a state enterprise. But because the conversion into a state enterprise would take too long, the RTN instead approved the restructuring of the U-Tapao Airport Division into “U-Tapao Airport Authority” to operate the U-Tapao Airport. Revenues and expenses from the airport operations were treated as off-budget operations in the form of

bank deposits. From then on, the U-Tapao Airport has been recognized as one of the regional airport of the East of Thailand.

After the political unrest in 2005, when Suvarnabhumi Airport was shut down by protesters and the major flood in Bangkok in 2011, the government recognized the necessity of establishing the third international airport for Bangkok, in addition to Don Mueang Airport and Suvarnabhumi Airport as part of contingency planning of the country's air transportation. The then-military government headed by chief of National Council for Peace and Order (NCPO) issued a directive of the chief of the NCPO at the 29 July 2014 ordering the Ministry of Transport in coordination with the Ministry of Defence and the RTN to draft a plan to develop U-Tapao Airport into the third main international commercial airport for Bangkok. On 12 September 2014, the government in its policy statement delivered at the National Legislative Assembly, laid out a plan to develop transport and communication infrastructure, specifically air transport to promote the utilization of the regional airport to handle growing air traffic as well as to establish an aviation industrial estate to engage in aviation maintenance and repair works as well as to develop the capacibility to provide air transportation services that meet the internationally-accepted standards, and to use a regional airport, like U-Tapao Airport to complement the operations of Suvarnabhumi Airport and Don Mueang Airport.

In accordance with the policies announced at the National Legislative Assembly above, the Ministry of Transport and the RTN have convened a meeting and agreed to develop U-Tapao Airport as the third international airport under the administration of the RTN. The airport must serve dual functions, namely national security and commercial aviation services under the concept "One Airport, Two Missions". The Ministry of Transport and the RTN represented by the transport minister and RTN chief, signed a Memorandum of Cooperation (MOC) on the development of U-Tapao Airport as the third major commercial airport of Bangkok, with the aim to harness synergy in the land development, business plan and infrastructure development to enhance the capability of U-Tapao Airport as the third commercial airport of Bangkok under the management of the RTN. The airport development plan was divided into 3 phases:

**Phase 1** (2015 – 2017): Increase the U-Tapao Airport's handling capability to 3 million passengers/year using the existing terminal (Terminal 1) and the new terminal, Terminal 2, which has recently been completed, with the RTN as the operator of the U-Tapao Airport as before.

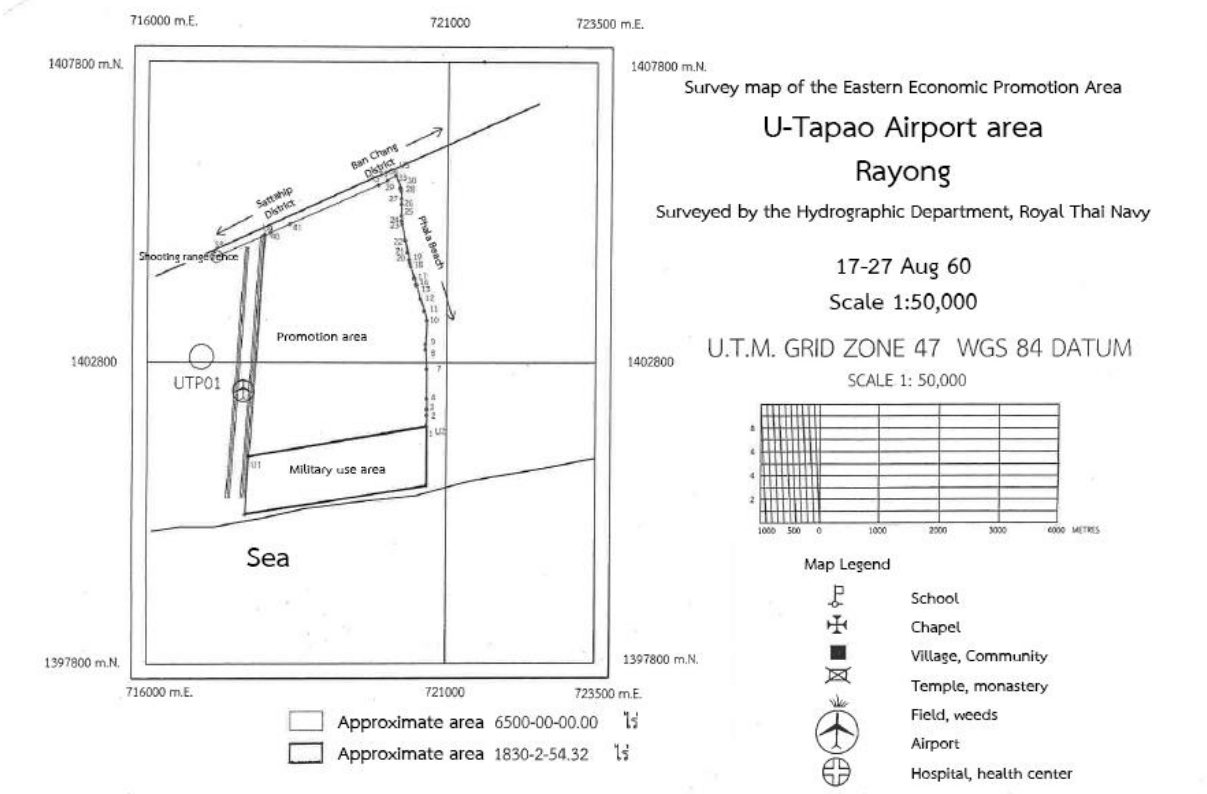
**Phase 2** (2018 - 2020): Step up readiness to develop infrastructure within the area under the RTN to handle an estimated 3 million passengers/year, taking advantage of Terminal 2, including the preparation of a study in the management of commercial service areas and security, subjecting to the approval of the RTN.

**Phase 3** (2020 onwards): Study infrastructure in Landside and Airside areas, develop facilities to increase capability to handle rising air traffic at the U-Tapao Airport in the future.

### 1.1.2 Development of U-Tapao Airport to correspond with the country's development plans/strategies

The 2017 Constitution of the Kingdom of Thailand envisions "20-year national strategy" as a long-term development blueprint for the country, with the objective to enhance the quality of the country in all sectors and to develop Thailand into a high-income country, with emphasis on competitiveness. To improve competitiveness, the government formulated Thailand 4.0 strategy in the manufacturing and services sectors based on cutting edge technologies and innovation, targeting 12 industries, of which air transportation and aviation are listed in No. 8. It is evident that the background and rationale for the development of U-Tapao Airport into a main commercial airport of Bangkok is consistent with and linked up to the country's development strategy.

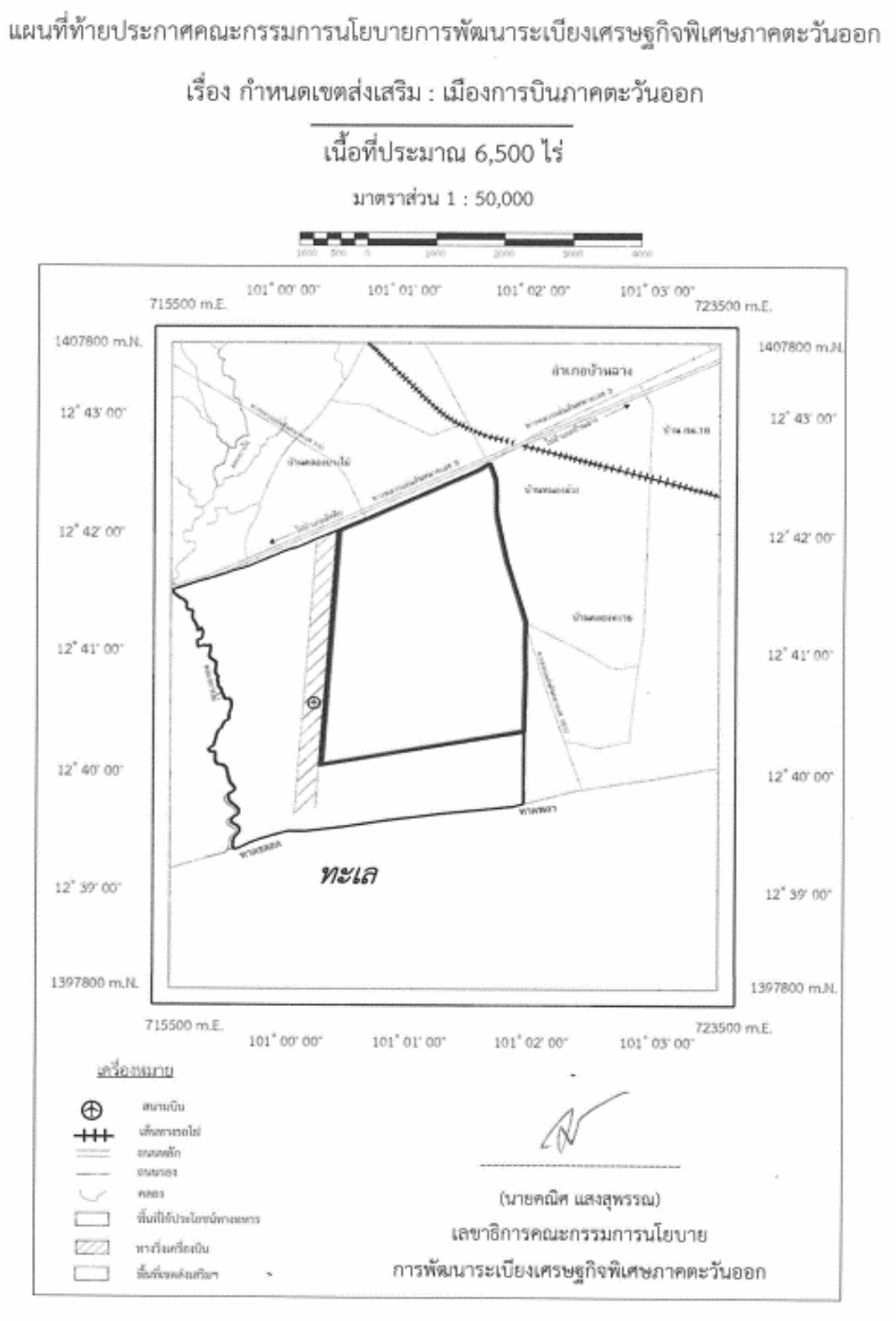
To boost Thailand 4.0 strategy, the government has implemented a strategy to promote and develop areas with high economic potential to lay the groundworks for continuous development leading to stability, prosperity and sustainability under the "Eastern Economic Corridor (EEC)", which is currently the "Eastern Special Development Zone, covering Chachoengsao Province, Chonburi Province and Rayong Province, under the Eastern Economic Corridor Office of Thailand (EECO), chaired by the prime minister. As the U-Tapao Airport is located in the EEC area, the government has accelerated to push for development of U-Tapao Airport to be the 3rd main commercial airport of Bangkok and to increase the capacity of the airport to serve as the regional Aviation Hub. Therefore, on 5 April 2017, the EEC Development Policy Committee in its 1/2560 meeting, approved the designation of an area of approximately 6,500 rai in the U-Tapao International Airport as EEC promotional zone: "Eastern Aerotropolis," while the RTN approved the plan to utilize the land area east of the existing runway, covering 6,500 rai in order to support the development of EEC according to government policy, and approximately 1,830 rai [redacted] as shown in Figure**Figure 1.1-**1.




**Source:** Hydrographic Department, RTN, August 2017

**Figure 1.1-1 Survey map of the eastern economic development promotion zone within the U-Tapao Airport, Rayong Province**

Based on the above map and approved by the RTN for the use of 6,500 rai for development, the Policy Committee issued the Notification Re: Promotion Zone: Eastern Aerotropolis, covering 6,500 rai at U-Tapao International Airport, Rayong Province, to support the aviation and logistics industries. The notification was published in Government Gazette No. 135, Special 41 D, on 23 February 2018. The map of the promotional zone is shown in **Figure 1.1-2**.




**Source:** Notification of the Eastern Economic Corridor Development Policy Committee Re: Designation of Promotional Zone: The Eastern Aerotropolis, published in the Government Gazette No. 135, Special Section 41 D, 23 February 2561

**Figure 1.1-2 Map appended to the Notification of the Eastern Economic Corridor Development Policy Committee Re: Designation of Promotional Zone: The Eastern Aerotropolis.**

On 6 July 2017, the Policy Committee, in its 2/2560 meeting, approved 4 EEC Project List, comprising: 1) U-Tapao Airport Development Project and the Eastern Aerotropolis, 2) The High-Speed Rail Project 3 connecting 3 airports, 3) Map Ta Phut Industrial Port Development Phase 3, and 4) Laem Chabang Port Development Phase 3. This was in keeping with the implementation of Notification of the Policy Committee Re: criteria, methods, conditions and procedures for joint investment with the private sector or for granting private sector to make investment 2018, amendments, and under the provisions of Section 12 of the EEC Act 2018, stating that the resolutions of the EEC Development Policy Committee shall legally bind ministries and all government agencies represented in the committee. This is to ensure that the objectives of the U-Tapao International Airport Development, initiated by the Ministry of Defence, the RTN and Ministry of Transport on the development of U-Tapao Airport into the 3rd main commercial airport of Bangkok, shall be supported by the EECO and further development of its capability to become a regional aviation hub.

Since then, the development of U-Tapao International Airport has been supported in line with and in accordance with the policy of the Policy Committee under "U-Tapao Airport Development and Eastern Aerotropolis Project" under a joint investment with the private sector or solely invested in by the private sector under the provisions of the EEC Act, with the detailed scope of the U-Tapao International Airport Development and Eastern Aerotropolis Project divided into 2 parts:

**Part 1**: This is the main component of the project, namely the development of U-Tapao International Airport into Bangkok's third main commercial airport to be able to handle no less than 60 million passengers/year, comprising the construction of Runway 2 and the construction of a new passenger terminal (Terminal 3).

**Part 2**: Developing commercial spaces to become an Aerotropolis as part of the business and commercial development in support of the aviation and logistics industries along with related businesses, which will help promote and advance the benefits of airport expansion.

The implementation of the U-Tapao Airport Development and Eastern Aerotropolis can be summarized as follows:

- On 12 February 2018: the Policy Committee issued Directive 1/2561 to appoint a selection committee to identify private investor to invest in the U-Tapao Airport development and Eastern Aerotropolis. The selection committee is chaired by the RTN chief, with the authority to select a private investor for a joint investment.
- On 4 October 2018: The Policy Committee at the meeting No. 4/2561, resolved to approve in principle the U-Tapao Airport and Eastern Aerotropolis Development Project for a joint investment with a private investor, and agreed that the RTN and EECO take joint responsibility in the implementation of the project.
- On 30 October 2018: The Cabinet resolved to approve in principle in support of the Policy Committee's resolution, and assigned the Ministry of Defence, Ministry of

Finance, Ministry of Transport, Ministry of Natural Resources and Environment, Budget Bureau, RTN, EECO and relevant government agencies to accelerate implementation of the project in accordance with the predetermined timeline.

- On 13 April 2020, the selection committee implemented selection process to identify private investors in accordance with Notification of the Policy Committee, as authorized and completed the selection. Private sector entity selected was BBS Joint Venture, comprising Bangkok Airways public Company Limited, BTS Group Holdings Public Company Limited and Sino-Thai Engineering and Construction Public Company Limited. The selection committee has approved a draft agreement, specifying the EECO as the government counterpart in the planned joint investment.

- On 21 May 2020: The Policy Committee approved the results of the selection of the private sector, the outcome of the negotiations, and approved the draft joint investment agreement reviewed by the Attorney General's Office, and agreed that the EECO should sign the agreement to become a counterpart in the joint investment with the selected private sector entity.

- On 2 June 2020: The Cabinet resolved to approve the outcome of the Policy Committee's meeting and assigned the EECO to sign the joint investment agreement with the juristic person in the form of a consortium of private companies that has been selected. The Cabinet also approved the RTN to implement selection process for the construction of Runway and Taxiway 2 in advance while awaiting for the result of the NEB consideration of the Environmental Impact Assessment Report under the provision of Section 49, Paragraph 4 of the Enhancement and Conservation of National Environmental Quality Act 1992 and amendments, and for the EECO and RTN to take into consideration the opinion of the Ministry of Natural Resources and Environment and the Budget Bureau in implementing related components of the projects.

- On 19 June 2020: The EECO signed a joint investment contract for the U-Tapao Airport Development and Eastern Aerotropolis Project with U-Tapao International Aviation Company Limited, a juristic person in the form of a consortium established by BBS Joint Venture Group.

The development of U-Tapao International Airport is a project under the Infrastructure Development Plan within the Eastern Special Development Zone. U-Tapao International Airport will operate in the form of a Public Private Partnership (PPP). There is a need to make a comprehensive plan for various components required to develop the area within the airport's boundaries. Therefore, a study is required to make a master plan for the U-Tapao International Airport so that its objectives correspond with the key policies and strategies, such as the 20-year National Strategy, the 12th National Economic and Social Development Plan (2017-2021), the 20-Year Strategy for the Development of Thailand's Transport System 2017-2036 of the Ministry of Transport, Eastern Economic Corridor (EEC) Development Policy, etc. Forecasts of air traffic

volumes, analyses on facility requirements of the U-Tapao International Airport and the adjustment of development phases that correspond with the rise in air traffic volumes in the future are as follows:

#### 1.1.2.1 20-year National Strategy

The National Strategy Committee established a 20-year national strategy 2018 - 2037 to provide a framework for government agencies to develop strategies relating to their respective missions based on the vision of "Stable, prosperous and sustainable Thailand attaining the status of a developed nation guided by the philosophy of sufficiency economy," or the national motto "Stability, Prosperity and Sustainability". The National Strategy that provide a framework for development in the 20-year period consists of 6 strategies:

1) The national strategy for security
2) The national strategy for building competitiveness
3) The national strategy for developing and building human resource capacity
4) The national strategy for creating opportunities and social equality
5) The national strategy for growth that is eco-friendly and enhances quality of life
6) The national strategy for re-balancing and developing public sector administrative systems

The 2nd "National Strategy for Building Competitiveness" focusing on investment in infrastructure and transportation development is directly linked to the Ministry of Transport and in line with the preparation of the master plan to establish a commercial airport under the framework of the 20-year national strategy, namely the development of transportation and services infrastructure to lay the foundation to strengthen the economic stability of the country by developing a comprehensive and efficient transportation infrastructure and logistics system. The emphasis is on investment in transportation infrastructure investment, development of spacial economic zones and hub cities and special economic zones along the borders as well as economic center cities linking up to regional and global economies and providing access to transportation service systems for all to ensure convenience, inclusiveness and safety as part of the effort to enhance social equality and a level playing field. In addition, agencies under the Ministry of Transport must be revamped to make sure they and their personnel carry out their tasks with efficiency and transparency.

#### 1.1.2.2 12th National Economic and Social Development Plan (2017 - 2021)

The vision guiding the 12th Development Plan focuses on determining the direction of development aimed to transition Thailand from a middle-income country into a high-income country with a stable and sustainable society and people living in harmony and happiness. The ultimate goal is to attain the long-term vision of "Stability, Prosperity and Sustainability" through 10 national development strategies. Strategy No. 7 on the development of infrastructure and

logistic systems has set goals to increase the capacity of Bangkok airports to handle up to 120 million passengers per year and regional airports to handle 55 million passengers per year.

In this regard, the 12th Development Plan also provided guidelines for the development of air transportation systems as follows:

1) Accelerate the development of Suvarnabhumi Airport and Don Mueang Airport according to the master plan. During the 12th Development Plan, study the alternatives and appropriateness of the expansion of the capacities of airports to prepare for an increase in air travel and air cargo traffic volumes to reach the full capacity of Suvarnabhumi Airport and Don Mueang Airport, prepare utilization plans and maintenance plans for regional airports to maximize returns on public investment as well as conducting study on airports with potential for further development, such as U-Tapao International Airport for the development of aviation industry.

2) Improve the airport management system to maintain safety management quality, personnel expertise, readiness of passenger and cargo handling facilities, and contingencies for emergency response in accordance with international standards and consistent with international cooperation agreements, such as those made with International Civil Aviation Organization (ICAO), European Aviation Safety Agency (EASA), Federal Aviation Administration (FAA) and Japan Civil Aviation Bureau (JCAB).

3) Develop Airspace Organization and Management to be capable of supporting current and future growth of air traffic volumes by improving efficiency, reducing delays and enhancing flexibility in flight handling, to stay competitive. Such developments must be consistent with the policies, standards and plans of the aviation development of the international community under the supervision of the International Civil Aviation Organization (ICAO) by maintaining close coordination between the Ministry of Transport, Ministry of Defence along with other government agencies and relevant private sector entities. In addition, key plans and projects must be formulated for the development of air transport systems, including the Suvarnabhumi Airport Development Plan; Don Mueang Airport Development Plan, Mae Sot Airport Development Plan, Betong Airport Development Plan and U-Tapao International Airport Development Plan.

#### 1.1.2.3 Thailand's 20-Year Transportation Development Strategy 2017 - 2036 by the Ministry of Transport

The 20-year strategy for the development of the transportation system of Thailand calls for the establishment of a plan of action to develop the air transportation system development with the objectives to improve the capability in air cargo handling capability by developing and improving airports, developing infrastructure for air transportation service system and improving the capability in support of the country's aviation system, airline and aviation business development, governance, air transportation safety and security management through short-term development (2017 - 2021) in line with the efforts to resolve Critical Transport Issues, which has been expedited during 2017 - 2018 to restructure state enterprises involved in air transportation and amending aviation regulations to align with international standards. The development in the medium term (2022 - 2026 focuses on the development of various transportation infrastructures to cover both

major cities in the regions and neighboring countries as well as revision of relevant laws and regulations to correspond with investments in infrastructure and transportation services to meet international standards as well as to promote related industries in line with the strategies and plans for the development of transportation infrastructure in Thailand 2015-2025 and long-term development (2027-2036) focusing on comprehensive, accessible and adequate infrastructure development, improving convenience in keeping with international standards and maintained in good working order to ensure safety in line with Thailand's 20-year transportation system development strategy.

#### 1.1.2.4 Eastern Economic Corridor (EEC) Development Policy

According to the Eastern Economic Corridor Development Plan (2017 - 2021) (with reference to the Main Report of the Eastern Economic Corridor Development Plan 2017 - 2021), prepared by Office of the National Economic and Social Development Board (November 2016) to build on the development of the Eastern Seaboard in the target areas of Chonburi, Rayong and Chachoengsao provinces to enhance the competitiveness of the nation to become a leading Asian economic zone by developing comprehensive infrastructures, promotion of city development and enhancement of urban living environment as well as investment promotion and privileges for investment in high-technologies and tourism to generate high economic growth, employment, improve quality of life and livelihood of local population. The EEC Development Plan consists of 4 components:

**1) Action plan to develop high potential industries:** Develop eco-friendly high-technology industries consistent with the potential of the area and expedite the resolution of pollution and environmental problems in the area to achieve concrete results.

**2) Action plan for transportation and logistics development:** Develop comprehensive transportation infrastructure and build a potential economic base and support the targeted industries to raise the level of national competitiveness.

**3) Action plan for urban development, public utilities and facilities and public health for tourism city:** Develop public utility and facility systems as well as social and environmental infrastructures to raise quality of life, create balanced conditions for wealth redistribution as well as to enhance urban living environment that is conducive to economic growth and social development corresponding to the EEC Development Plan.

**4) Administration:** Provide benefits to attract targeted industries to drive the economy for the future.

One of the methods for developing transportation and logistics infrastructure is the development of the U-Tapao International Airport as the 3rd commercial airport of Bangkok to increase its capacity to handle up to 60 million passengers per year within 15 years, complete with the development of systematic network to link up all 3 main airports. This has been taken into account in developing the master plan for the U-Tapao International Airport Development in line with such policy. Airports of Thailand has considered the roles of the 3 airports, namely Don Mueang Airport,

Suvarnabhumi Airport and U-Tapao International Airport to handle increasing air traffic volumes and passengers based on forecasts of passengers passing through Suvarnabhumi Airport and Don Mueang Airport (referencing the results of forecasts of air traffic volumes and number of passengers, the master plan for the development of Suvarnabhumi Airport (Revised edition) February 2016, Chapter 3: Forecasts of air traffic volumes). The forecasts were based on factors contributing to the overall traffic volumes, taking into account both domestic and global economies, changes in aviation regulations, natural disasters, epidemics, and political factors, using data on these factors in the past 10 years (2007 - 2017) as criteria along with forecasts made by the Airports Council International (ACI). Results of growth analysis indicated analysis based on normal steady growth (intermediate level). According to the forecasts, by 2037, the number of air passengers passing through Bangkok will be 213.07 million. Of this, Suvarnabhumi Airport, Don Mueang Airport, and U-Tapao International Airport will handle 127.14 million, 82.36 million and 3.57 million, respectively, with an average growth rates of 4.5%, 6.0% and 15.5%, respectively, as shown in**Table 1.1-1**

**Table 1.1-1 Results of the forecasts of number of air passengers passing through Bangkok, based on normal steady growth trend ***

**Unit: million**

| Year | Suvarnabhumi Airport | | Don Mueang Airport | | U-Tapao International Airport [1/] | Total passengers Bangkok |
|---|---|---|---|---|---|---|
| | International | Domestic passengers | International | Domestic passengers | Total international and domestic | |
| 2017 | 53.13 | 11.34 | 14.36 | 23.94 | 1.40 | 99.29 |
| 2022 | 64.33 | 13.21 | 25.19 | 27.15 | 1.30 | 130.13 |
| 2027 | 79.56 | 14.66 | 32.05 | 30.24 | 1.82 | 157.63 |
| 2032 | 94.57 | 16.11 | 38.95 | 33.32 | 2.55 | 184.54 |
| 2037 | 109.58 | 17.56 | 45.90 | 36.46 | 3.57 | 213.07 |

**Note:** * refers to the projections as of May 2018

[1/] refers to the forecasts of the number of passengers in case of no expansion of the runway at U-Tapao International Airport.

**Source:** AoT analysis based on forecasts of the ICAO and IATA, referenced in the master plan for the development of Suvarnabhumi Airport, September 2018

The 3 airports that handle air traffic volumes of Bangkok are in the process of development, with plans to increase their capacity to handle the steady increase in air traffic volumes. In 2015 – 2020, there are projects that have been approved and are in progress. Based on air traffic forecasts, in 2018-2020, Don Mueang Airport would have reached its full capacity in its handling of flights and passenger traffic volumes and can no longer be upgraded, Therefore, after 2020, Suvarnabhumi Airport and U-Tapao International Airport will have to handle any excess traffic volumes.

According to the policy for the development of the U-Tapao International Airport under the Eastern Economic Corridor (EEC) Project, U-Tapao International Airport will be developed to handle some of the air traffic volumes in support of the Don Mueang Airport and Suvarnabhumi Airport in the future. However, all three airports need to be studied with a view to find an

integrated approach to maximize benefits of their development in a coordinated and continuous manner. The Airports of Thailand held a meeting to discuss with the Eastern Economic Corridor Office of Thailand (EECO) on 31 May 2018 to establish the linkage between the master plans for the development of Suvarnabhumi Airport, Don Mueang Airport and U-Tapao International Airport Conclusions as follows:

"Suvarnabhumi Airport, Don Mueang Airport and U-Tapao International Airport are the country's main airports with different roles for mutual support. Suvarnabhumi Airport continues to be the Major Choice (Network Premium Hub), Don Mueang Airport serves Low Cost Carriers (LCC Hub) and U-Tapao International Airport is Multimodal Transportation Hub to support Emerging Markets. U-Tapao International Airport will be developed to handle passengers and air transportation volumes deriving from the industrial promotion in the EEC area (Chachoengsao, Chonburi and Rayong provinces) as well as Overflow from Suvarnabhumi Airport and Don Mueang Airport, which are expected to grow rapidly. Therefore, the growth forecasts of U-Tapao International Airport does not overlap with those of Suvarnabhumi Airport and Don Mueang Airport. The development of U-Tapao International Airport according to the policy of the RTN, focusing on being the 3rd commercial airport of Bangkok (after Suvarnabhumi Airport and Don Mueang Airport). The U-Tapao International Airport will have new terminals to handle an additional 30 million passengers per year, and in 20 years will increase the capacity to handle up to 60 million passengers per year."

### 1.1.3 Rationale for Runway 2 and project components

According to the government policy that determines the goal of the U-Tapao International Airport development to handle at least 60 million passengers/year. Therefore, it is necessary to expand U-Tapao International Airport, which currently has a single runway, handling up to 3 million passengers/year, by building Runway 2 and project components, which form the key part of the development of U-Tapao International Airport and Eastern Aerotropolis development project, which, under the joint investment agreement, assigned the RTN to take charge of the Runway 2 construction, while the private sector is responsible for the construction of a new passenger terminal (Terminal 3), land-based transportation hub, additional taxiway from the taxiway construction carried out by the RTN, construction of airport apron, construction of air transportation and logistics center as well as secondary public utilities in rental spaces, road system, integrated power distribution, tap water and wastewater systems.

The joint investment agreement specifies conditions for granting the rights for the private sector party to participate in the implementation of the project after the report of the environmental impact assessment of Runway 2 construction of the RTN and construction of buildings, which is the main task for which the private sector is responsible (in case that they are required to prepare the environmental impact assessment report), are approved by relevant government agencies, in accordance with the rules and procedures as required by the laws governing national environmental quality promotion and conservation or any relevant Thai laws.

Therefore, as the EECO and RTN, which have been assigned as the main agencies to jointly implement the project, it is necessary to implement Runway 2 construction and its project components in order to achieve the above development goals of the U-Tapao International Airport, to support the development of the EEC area and the national development goals under the National Plan and Strategy Thailand 4.0, in accordance with the conditions and requirements of environmental laws.

The development of U-Tapao International Airport (extension) calls for the construction of Runway 2 that is 3,505 meters in length, which falls within the scope of projects or activities that may cause serious impact to communities under Category 8 Project of **aviation transportation system, specifically the construction or expansion of airport or temporary takeoff and landing of aircraft under the law governing aviation**" of "**runway from 3,000 meters in length and over"** according to the Notification of the Ministry of Natural Resources and Environment, Re: Project, Business or Activities that may severely affect the natural resources, environmental quality, health, public hygiene, quality of life of people in the communities, which must prepare an environmental impact assessment report and the rules, procedures and conditions for preparing environmental impact assessment report (2nd edition) dated 28 November 2019 (Published in the Government Gazette on 16 January 2020) hereinafter to be referred to as the "Project" in place of the U-Tapao International Airport Development Project, as part of the expansion of the U-Tapao International Airport, with the construction of Runway 2 and project components necessary for the air transportation system.

## 1.2 Components of and current data on passenger traffic volume at the U-Tapao International Airport

U-Tapao International Airport is located in Ban Chang District, Rayong Province, about 35 kilometers west of Rayong city, and about 30 kilometers south of downtown Pattaya. U-Tapao International Airport is located on government land according to the government land certificate No. RY 0493, Plot No. 1., covering 12,689 rai, which is under the supervision of the Ministry of Finance (U-Tapao Airport). At present, the U-Tapao International Airport consists of the following components:

**Runway:** U-Tapao International Airport currently has 1 runway (a runway under standard code 4E according to ICAO criteria), measuring from end to end (Thresholds 18 and 36) 3,505 meters in length and 60 meters in width. The landing is from Threshold 18 side of the runway, using the Instrument Landing System (ILS), which is Precision CAT I Runway. Details of the current runway of the U-Tapao International Airport is shown in **Table 1.2-1.**

**Table 1.2-1 Details of the current runways of U-Tapao International Airport**

| Components of runway | Current runway conditions | |
|---|---|---|
| | Threshold 18 | Threshold 36 |
| - TORA[1/] (m.) | 3,505 | 3,505 |
| - TODA[2/] (m.) | 3,810 | 3,810 |
| - ASDA[3/] (m.) | 3,810 | 3,810 |
| - NDA[4/] (m.) | 3,505 | 3,505 |
| - Stopway (m.) | 305 × 60 | 305 × 60 |
| - Clearway (m.) | 305 × 300 | 305 × 300 |
| - RESA[5/] (m.) | 140 x 300 | 110 × 300 |
| - Runway Strip (m.) | 4,235×300 | |
| - Instrument Type | Precision CAT I | - |

**Notes:** [1/]TORA = Take-Off Run Available [2/]TODA = Take-Off Distance Available
[3/]ASDA = Accelerate-Stop Distance Available [4/]LDA = Landing Distance Available
[5/]RESA = Runway End Safety Area

**Airport apron**: Currently, there are 2 airport aprons, namely 1) 49-bay Alpha, Bravo and Charlie Apron, and 2) 6 aprons at the Passenger Terminal 2.

**Terminal:** Currently there are 2 terminals, with the following details:

- Passenger Terminal 1 has an area of 2,000 square meters and can handle approximately 1 million passengers per year. At present, the terminal is not used to handle passengers, but used as an office building.
- Terminal 2 has an area of 22,000 square meters and can handle around 3 million passengers per year. It is a newly built building that currently serves both inbound domestic and international flights. Terminal 2 consists of 24 check-in counters (12 international and 12 domestic), 8 immigration counters, 2 aerobridges, 2 domestic baggage carousels, and 2 international baggage carousels. Terminal 2 has the passenger screening and sorting system capability. The layout of Terminal 2 as shown in **Figure 1.2-1** and Figure**Figure 1.2-2**.

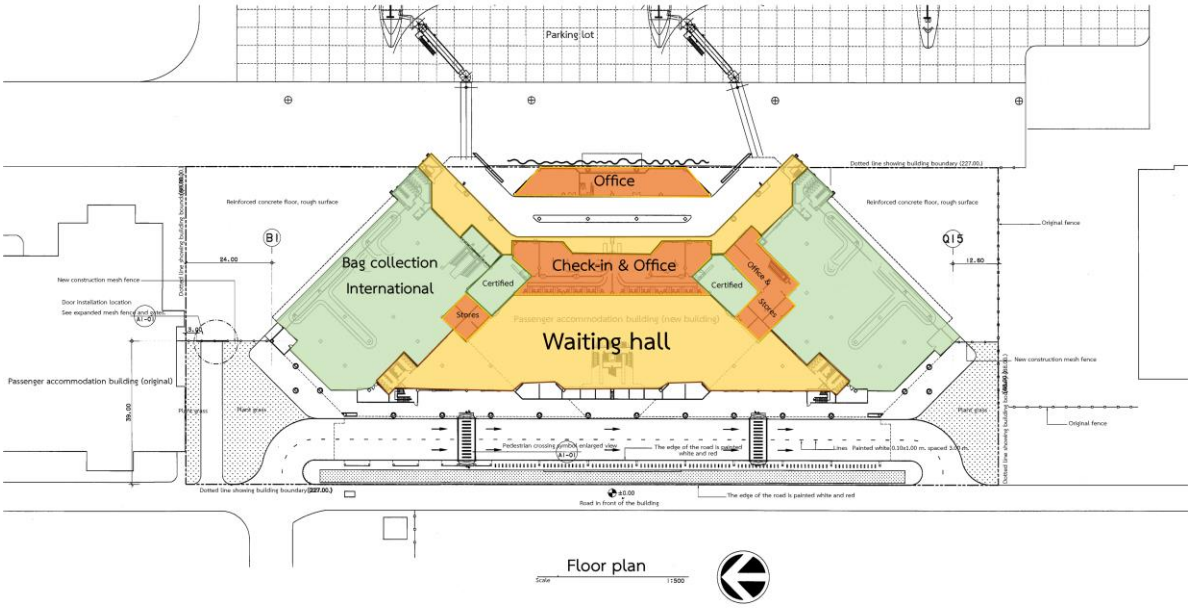



**Figure 1.2-1 Layout of Terminal 2 (1st Floor)**

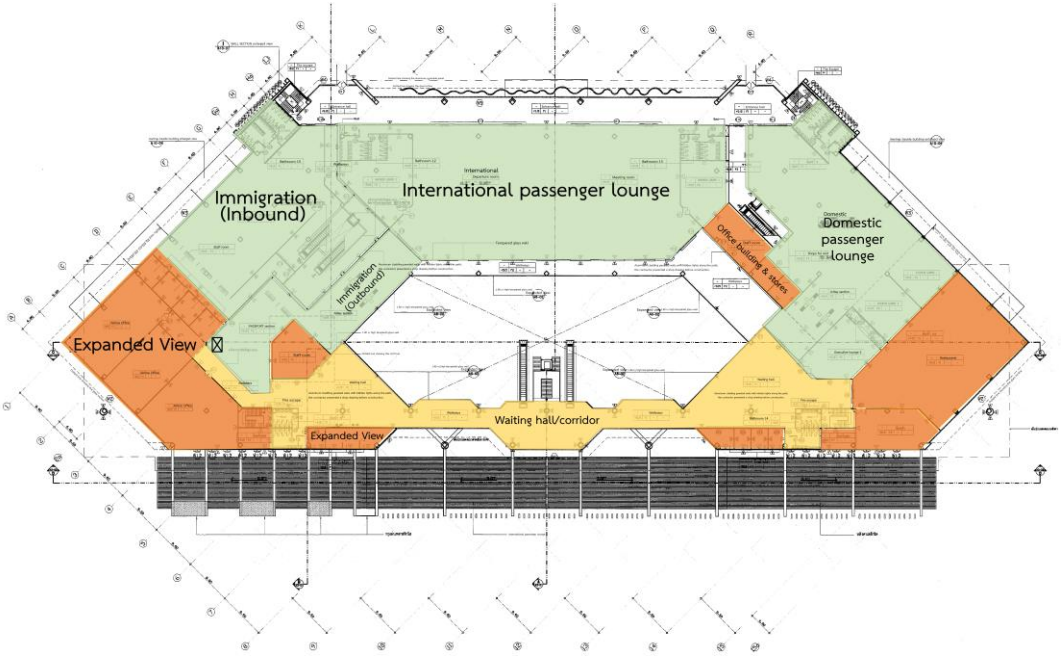



**Figure 1.2-2 Layout of Terminal 2 (2nd Floor)**

**Facilities available at the passenger terminal:** Inside the terminal, there are facilities for the passengers, detailed as follows:

- 12 check-in counters (staffed by personnel) with a capacity of handling 255 passengers per hour (for international flights) and 420 passengers per hour (for domestic flights).
- 8 departure immigration counters (staffed by personnel) have a capacity of handling 240 passengers at peak hours every 30 minutes, or the equivalent of 480 passengers per hour (240×2).

- The 2 X-ray channels (for international flights) have a capacity of processing 180 passengers at peak hours every 30 minutes, or the equivalent of 360 passengers per hour (180×2).
- The 2 X-ray channels (for domestic flights) have a capacity of processing 180 passengers at peak hours every 30 minutes, or the equivalent of 360 passengers per hour (180×2).
- 8 Arrival Immigration counters (staffed by personnel) for international flights have a capacity of processing 345 passengers per hour (Note: There are 2 Visa-on-Arrival counters at Terminal 2).
- Luggage Conveyor Belts of 1×40-meter and 1×25-meter sizes for international and domestic baggage claim areas, are able to handle 325 passengers per hour.

The flow chart of passengers within the current terminal is as shown in **Figure 1.2-3** Flow chart

Other facilities include:

- Flight control tower (height 30 meters)
- Meteorological Station
- Fire station, with 5 fire trucks (the parking lot is for 8 trucks)
- Ground service center (parking lot can accommodate up to 8 vehicles)
- Airport entrance road (2-lane in each direction)
- Fuel depot (outside the airport area) currently consists of 2 Jet A-1 tanks.

Public utility systems, comprising:

- Electrical substation: At present, Electricity Authority the Royal Thai Navy Welfare Concession located in Sattahip Subdistrict, has been granted concession to provide electricity supply by the Ministry of Energy by purchasing 115 kilovolts of electricity from the Provincial Electricity Authority for electricity generation and distribution in Sattahip District, Chonburi Province, covering 5 subdistricts, 41 villages in an area of 348.122 square kilometers, in Sattahip Subdistrict, Phlu Ta Luang Subdistrict, Samaesarn Subdistrict, Bang Sare Subdistrict and Na Jomtien Subdistrict. There are 52,489 service users (Source: Electricity Business, Navy Welfare Concession 2019). The Navy Welfare Concession also supplies electricity to agencies within the U-Tapao International Airport and the Royal Thai Naval Air Division as well. Electricity supply feeding to the Royal Thai Naval Air Division is converted to 220 volts before being distributed to the office building of the Airports of Thailand and the Royal Thai Naval Air Division. The substation of the Royal Thai Naval Air Division consists of 5 feeders: Feeders 1, 2, 3, 4 to supply electricity to the Royal Thai Naval Air Division and Feeder 5 to supply to the U-Tapao International Airport. In addition, the Royal Thai Naval Air Division also has a power generating plant as a back-up power plant in case of disruptions, which has the capacity to provide electricity for about 20-30 minutes.

- Tap water system: Currently, U-Tapao Airport and Royal Thai Naval Air Division use tap water from the tap water supply business of the Royal Thai Navy Welfare Concession, which supplies tap water to government agencies and government residential housing in Sattahip and nearby areas. The tap water supply business draws raw water from Khlong Bang Phai for the production of tap water at its Filtration Plant 2 located within the Royal Thai Naval Air Division.
- Open ditch drainage: drainage ditch designed and built since the construction of the airport to drain rainwater runoff. The ditches are dredged 1-2 times/year in the dry season.

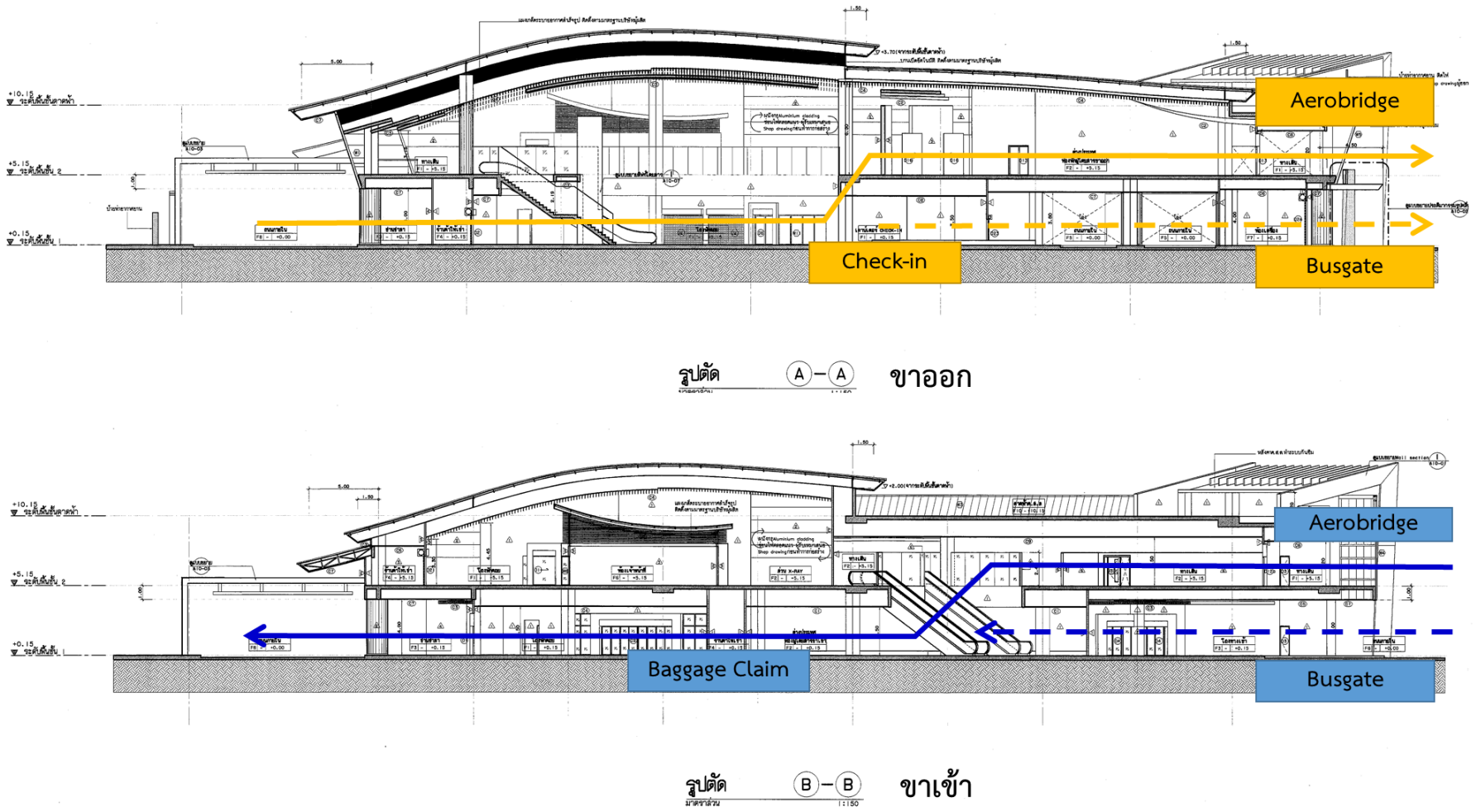



**Figure 1.2-3 Flow chart of passengers at Terminal 2**

- Wastewater collection system and wastewater treatment system: The original wastewater treatment system of U-Tapao International Airport, constructed by the United States in 1965, was a Lagoon Treatment System located on the southwest side of Runway 1 (close to the current Activated Sludge (AS) system). Used continuously until the year 1970 when the wastewater treatment system broke down. Wastewater from various activities of U-Tapao International Airport was therefore collected by gravity into the wastewater intake pipe of the old Lagoon Treatment System. But the wastewater was not collected into the treatment system but was discharged into natural drainage lines in the airport area draining into Khlong Bang Phai and flowing into the sea. In 2019, construction of a new wastewater treatment system began.

  The new Activated Sludge (AS) system, with a treatment capacity of 75 cubic meters per day is located southwest of Runway 1, and is adequate to treat wastewater from Terminal 2 and other buildings within the airport, which discharge about 50 cubic meters of wastewater per day.
- Waste management: Currently, the solid waste management at U-Tapao International Airport is carried out by collecting solid waste from Terminal 1 twice a day, and from office buildings once per day to the solid waste segregation facility of a private company that has been granted the concession from the RTN. The solid waste segregation facility is located in Khao Tabaek Km. 8, about 6 kilometers from U-Tapao International Airport. There is a Leachate in the area as well.
- Firefighting water tower: Located at Water Production Plant 2, the water tower distributes water through pipes to 8 fire hydrants around the current runway.
- Telephone system: Currently there is analog PABX system with Core Switch located in Terminal 1. The 22 kilovolt telephone lines are used.

The layout of current components of the U-Tapao International Airport is shown in Figure**Figure** 1.2-4.

According to the statistics of U-Tapao Airport, the numbers of flights and passengers handled by the U-Tapao International Airport in 2015 - 2020 as shown in**Table 1.2-**2. The latest information in October in 2020 indicated 5,625 flights and 532,700 passengers.

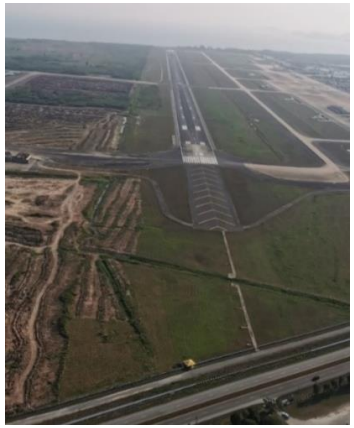
**Table 1.2-2 Numbers of flights and passengers handled by the U-Tapao International Airport during 2015 - 2020**

| Year | Number of passengers (person) | Number of flights (flight) |
|---|---|---|
| 2015 | 241,384 | 4,611 |
| 2016 | 783,846 | 8,374 |
| 2017 | 1,448,675 | 12,484 |
| 2018 | 1,856,997 | 15,096 |
| 2019 | 1,715,949 | 13,690 |
| 2020* (October) | 532,700 | 5,625 |

**Note:** * refers to the latest information in October 2020

**Source:** U-Tapao Airport, 2021


Terminal 2



Runway 1 (18R)

Current Air Traffic Control Tower

Current components

1. Runway 1
2. Terminal
   - 2.1 Terminal 1
   - 2.2 Terminal 2
3. Apron
   - 3.1 Alpha apron
   - 3.2 Bravo apron
   - 3.3 Charlie apron
   - 3.4 Apron
     - Area of Terminal 2
4. Meteorological Station
5. Control tower
6. Fire Station
7. Thai Airways Aircraft Maintenance Center

**Figure 1.2-4 Layout of current components**

**Thai Airways Aircraft Maintenance Center:** Currently located on the east side of Runway 1. Previously, Thai Airways International Public Company Limited (THAI) has a plan to develop a new aircraft maintenance center. The Eastern Special Development Zone's Policy Office decided to coordinate with THAI to jointly develop and revise the project. The THAI lease agreement for the current aircraft maintenance center site was terminated and the maintenance center had to be dismantled according to the terms of the lease agreement. The RTN has been assigned by the government to take charge of the construction of a new aircraft maintenance center and the construction of the Bypass Taxiway linking Runway 1 with airport aprons. The aircraft maintenance center was to be completed as soon as possible to mitigate impact on THAI in the absence of an aircraft maintenance center. The new maintenance center will be located in the Technical Zone, using the road on the east side as the main entrance of the project as shown in **Figure 1.2-**5 The construction of a road connecting Runway 1 with the new Maintenance, Repair and Overhaul (MRO) Center, complete with airport aprons and bays is not part of the Runway 2 construction and therefore the EIA of the MRO is not included in this EHIA. Taxiway connecting Runway 1 with the new MRO is part of the development of the MRO Center into a Smart Hangar. The agencies and relevant parties met to discuss the matters at Meeting KRS 5/2560 and contractors have been engaged to implement the aforementioned construction work under Agreement No. 5/NP 2564 as detailed in **Appendix 1-1** and is now considered part of the pre-existing development of the U-Tapao International Airport – and not part a runway construction to accommodate the takeoff and landing of aircraft.

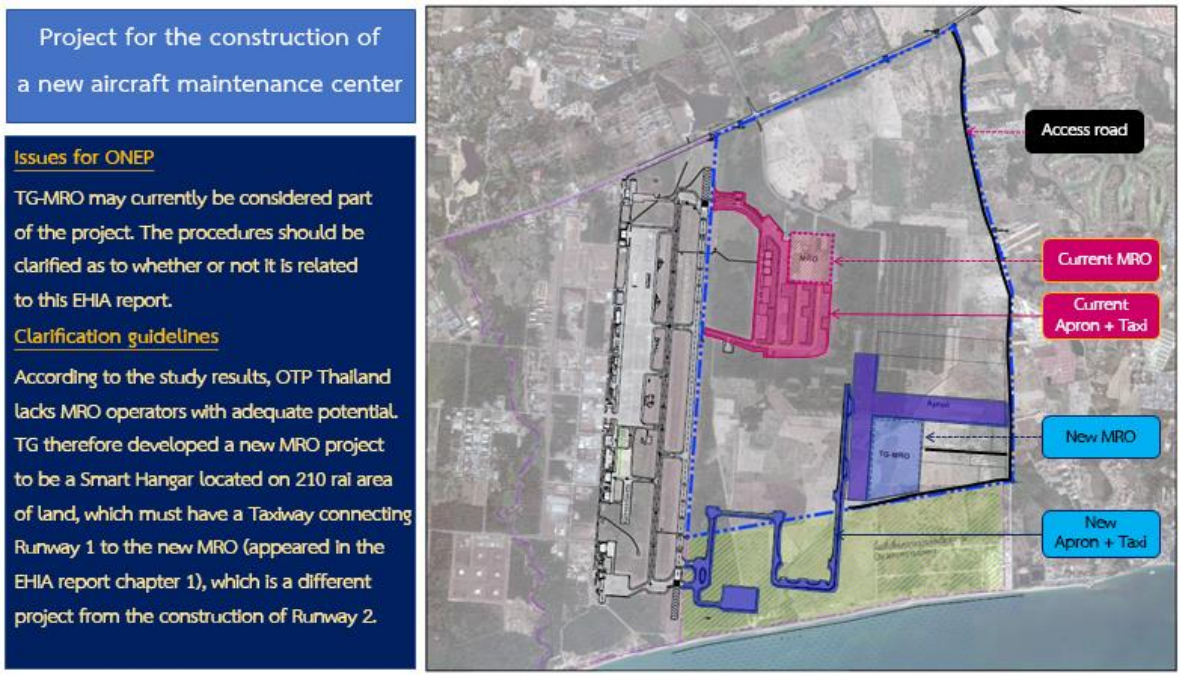



**Figure 1.2-5 Location of the new MRO of THAI**

## 1.3 Plan for the implementation of the U-Tapao International Airport development

U-Tapao International Airport Development Project and Eastern Aerotropolis Development Project are part of the joint investment projects implemented in accordance with

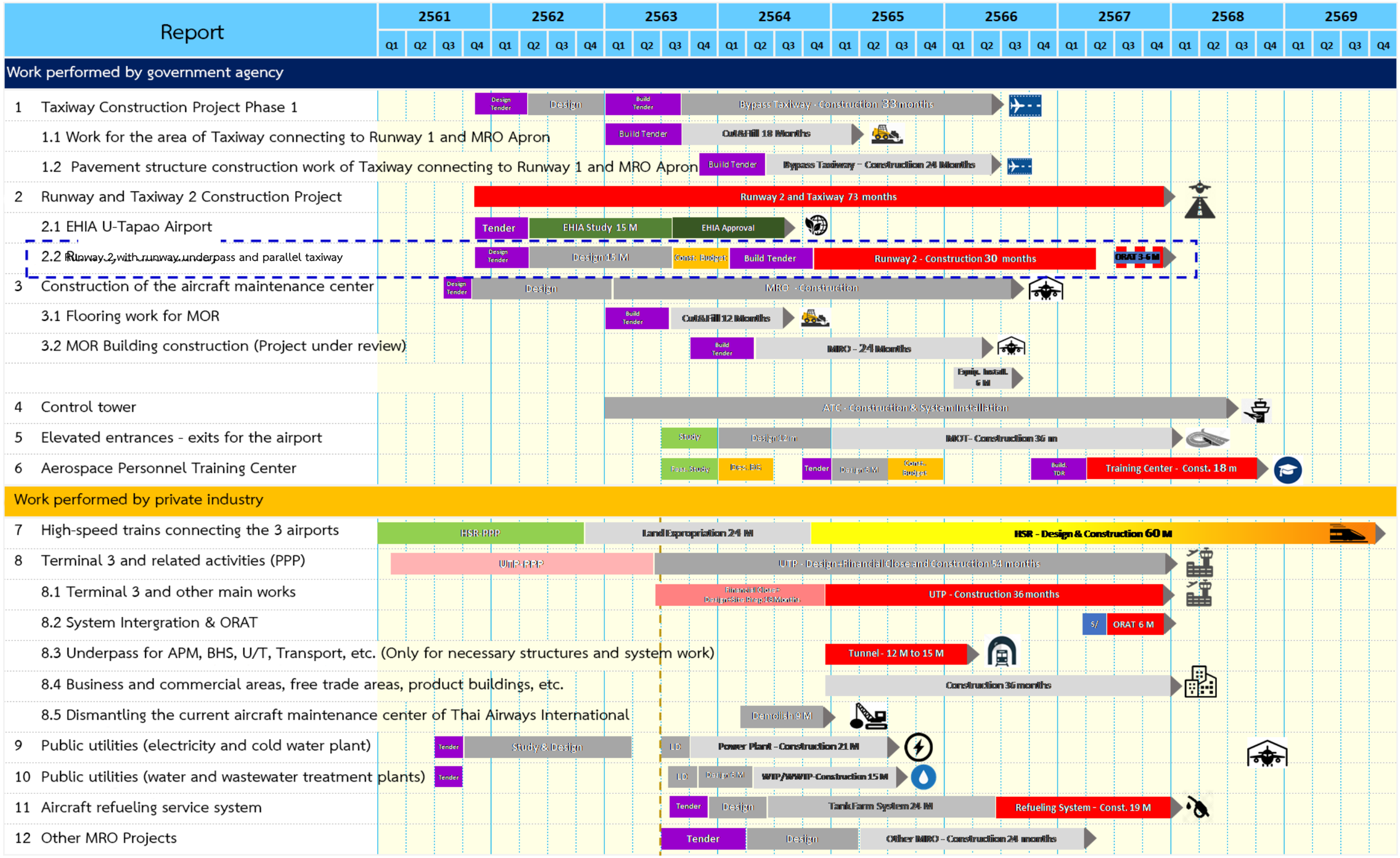
the Notification of the Eastern Economic Corridor Development Policy Committee Re: Criteria, Methods, Conditions and Procedures for Joint Investment with Private Sector Entities or Private Investors 2017, with the goal to develop it into "Bangkok's third major international commercial airport (Bangkok Airport System or BAS)" and to be developed into an aviation city, which will connect to Suvarnabhumi Airport and Don Mueang Airport by high-speed train.

The implementation of the U-Tapao International Airport Development Project and the Eastern Aerotropolis Development Project were designed to increase air passenger handling capacity to 70 million per year (by 2048), will require the construction Runway 2, which is expected to take 36 months to complete. The government has assigned the RTN to take charge of the construction of Runway and Taxiway 2, to be built by contractor selected to implement the construction.

In the development of U-Tapao International Airport in the Promotion Zone: Eastern Aerotropolis has involved several relevant agencies, such as private joint-investors, the Eastern Economic Corridor Office of Thailand (EECO), RTN, THAI, Civil Aviation Training Center (CATC) as well as private sector operators leasing land to operate central public utility system of the airport. Details of plans for the development of U-Tapao International Airport are shown in **Table 1.3-**1.

The construction of Runway 2 is considered an extension of the airport development, which falls under the criteria of projects requiring the preparation of an EIA report. The extension of the airport development consists of 2 components: 1) Air transportation system (blue area within orange frame), and 2) Commercial area or Commercial Gateway (yellow area within orange frame). When the construction is completed, the air transportation system component will consist of the current airport (area within dotted blue frame) plus the blue area within orange frame, encompassing the Operation Phase, taking into account the operations of the airport and the number of flights and number of passengers under the forecast up to 2048 (Ultimate Phase). As for the area marked in gray, which is not covered in this EIA, is being earmarked for development in order to provide an overall U-Tapao Airport development as shown in **Figure 1.3-1**

Table 1.3□1 Implementation pan for the U-Tapao International Airport and Eastern Aerotropolis development projects




**Source:** The EEC Office of Thailand, 2020

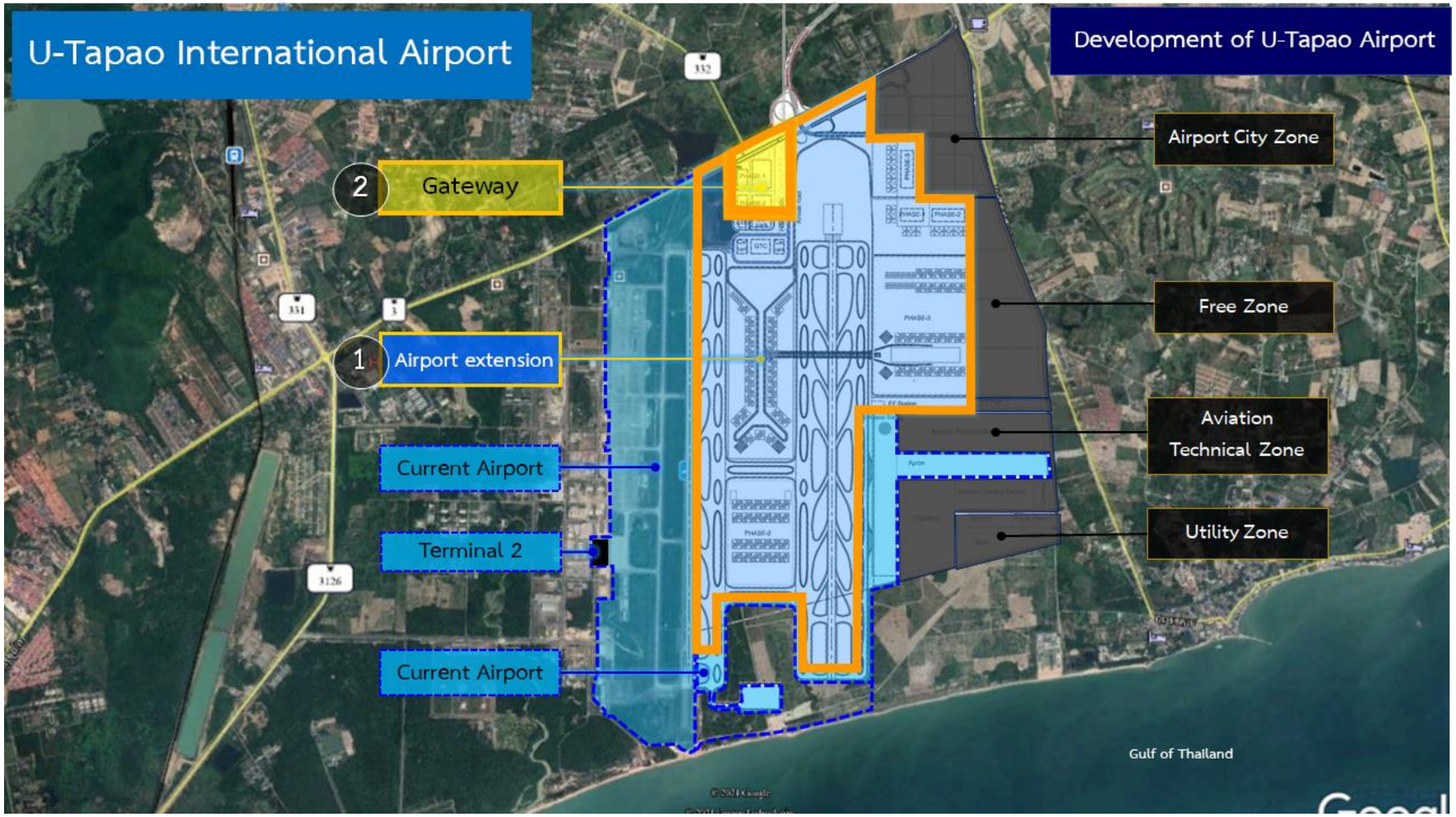



**Figure 1.3□1 Scope of Project Areas in U-Tapao International Airport covered by the study and this EIA report (orange frame)**

## 1.4 Objectives of this report

The EIA report for Runway and Taxiway 2 Construction Project, U-Tapao International Airport, Ban Chang District, Rayong has the following objectives:

1) To categorize and forecast potential environmental impacts of the project both positive and negative, compared to the no-go alternative.

2) To prevent and resolve negative environmental impacts from the project planning stage to be able to determine preventive measures and resolve impacts appropriately in terms of budgetary planning and practicality compared with trying to solve problems after they happened.

3) To take into consideration environmental factors in the planning and decision-making process to ensure the project is aligned with the U-Tapao International Airport development plan that stresses the importance of eco-friendliness and sustainable development of communities.

4) To determine environmental impact monitoring measures

## 1.5 Environmental Impact Study area and methods

As the U-Tapao International Airport is currently operated by U-Tapao Airport Authority under the RTN, in order to demonstrate that the implementation/operation of the public airport covers the entire airport, which will facilitate the issuance of public airport operating certificate to cover both Runways 1 and 2 which are indivisible, and so that relevant measures can be incorporated into those contained in the EHIA report as conditions in the appendix to the certificate to be issued in the future.

In this regard, the determination of study area of the development of U-Tapao International Airport (extension), which is located within U-Tapao International Airport area covering approximately 12,689 rai (area within green frame) according to the government certificate No. RY 0493. The project area covers approximately 4,415 rai (area within the orange frame), as shown in**Figure 1.3-1** 4,233 rai of which is located within in the Promotion Zone: Eastern Aerotropolis, while the other 182 rai is in the military zone for use to ensure airport safety and national security.

When the construction of Runway 2 is completed, the Operation Phase of the airport will be about implementation/operation of the public airport, covering the entire area of the airport, including the use of both Runways 1 and 2 together. Therefore, in determining the study framework, the project stipulates that the study scope covers the area of up to 6 kilometers on both ends of the east-west axis, and up to 10 kilometers on both ends of the north-south axis, from the perimeter of U-Tapao International Airport (area within green frame) in order to cover all possible impacts on sensitive areas and surrounding communities. The study area covers 2 provinces, 4 districts, and 10 sub-districts, as detailed in **Table 1.5-**1 and**Figure 1.5-**1

After this report has been approved by the RTN and EECO, measures will be incorporated into conditions for the purpose of seeking a certificate to operate a public airport, which the Civil Aviation Authority of Thailand (CAAT) will consider issuing to U-Tapao Airport.

**Table 1.5-1 Study Area for the Project's EIA**

| Province (2 provinces) | District (4 districts) | Subdistrict (10 subdistricts) |
|---|---|---|
| 1) Rayong | 1) Ban Chang | 1) Phala (location of the project) |
| | | 2) Sam Nak Thon |
| | | 3) Ban Chang |
| | 2) Mueang Rayong | 4) Huai Pong |
| 2) Chonburi | 1) Bang Lamung | 1) Huai Yai |
| | 2) Sattahip | 2) Na Jomtien |
| | | 3) Bang Sare |
| | | 4) Phlu Ta Luang |
| | | 5) Sattahip |
| | | 6) Samaesarn |
| **Total** | **4 Districts** | **10 Subdistricts** |

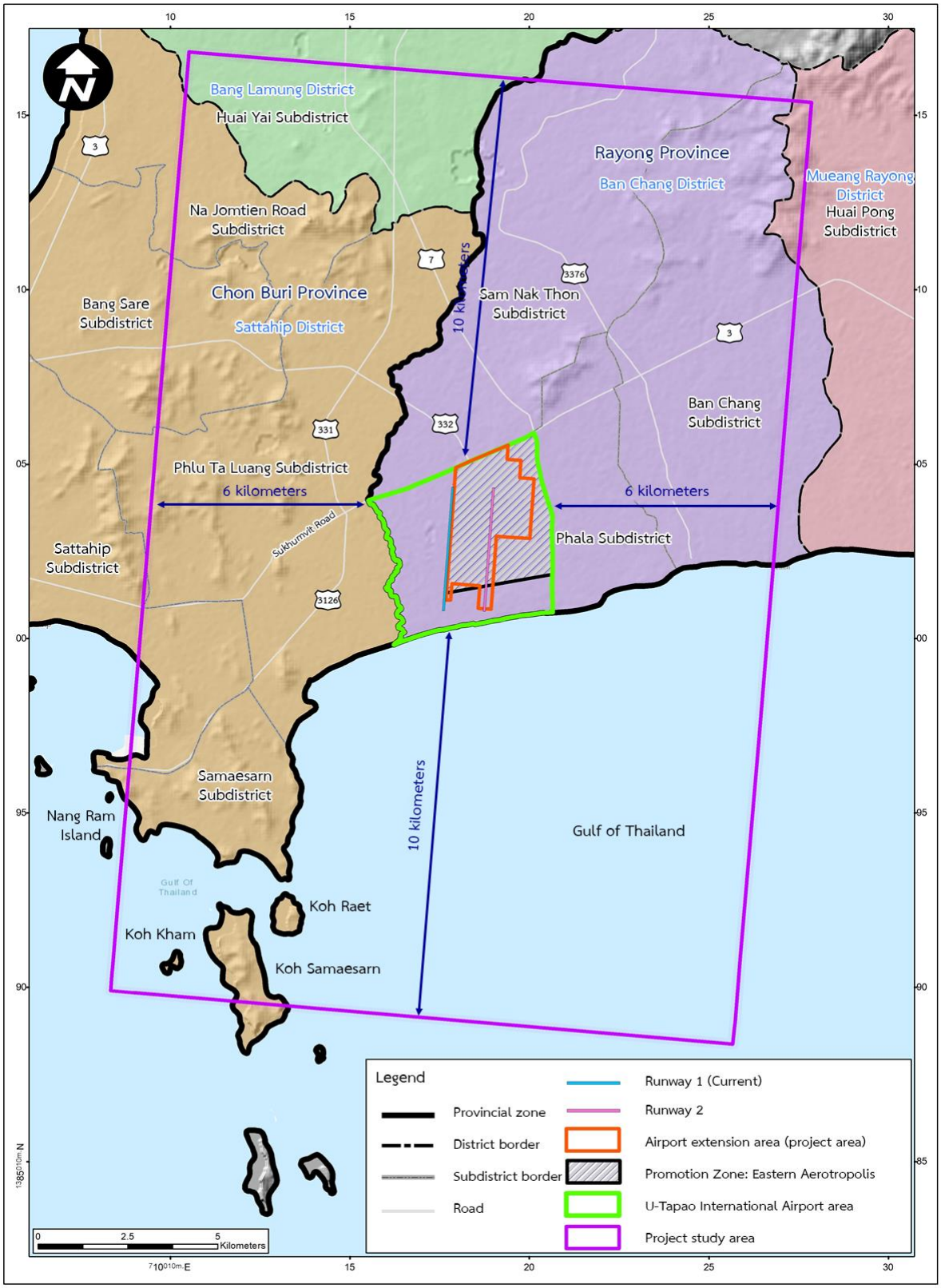



**Figure 1.5□1 Study Area of the Project's EIA**

## 1.6 Environmental impact study guidelines

Study and prepare an environmental impact assessment report on the Runway and Taxiway 2 Construction Project, U-Tapao International Airport, referencing and complying with relevant guidelines and regulations as follows:

1) Notification of the Ministry of Natural Resources and Environment Re: Determination of Projects, Businesses or Operations that May Severely Impact Natural Resources, Environmental Quality, and the Health, Sanitation, and Quality of Life of People in the Community, in which an environmental impact assessment report must be prepared in accordance with the criteria, procedures, and conditions for environmental impact assessment reports 2018 and (No. 2) 2019.

2) Guidelines for the Assessment of Environmental Impacts for Transportation Projects (Environmental Impact Assessments for Airports or Airport Projects) of the Office of Environmental Impact Assessment, Office of Natural Resources and Environmental Policy and Planning (ONEP) (2006).

3) Guidelines for health impact assessment in the EIA report of Thailand, December 2009 of the ONEP and the revised edition (2013).

4) Notification of Office of Natural Resources and Environmental Policy and Planning, Re: Guidelines for Public Participation in the Procedure Providing an Environmental Impact Assessment Report (2019).

5) Laws, rules and regulations of relevant government agencies.

## 1.7 Environment Impact Study Procedures and Scope

The study and preparation of the environmental impact assessment report must follow the procedures as shown in **Figure 1.7-1** The U-Tapao International Airport under the supervision of RTN was initiated in 1961 when the RTN sought to build a naval airport as mentioned in Section 1.1. At that time, no environmental impact assessment study or report were prepared.

The study of environmental impacts of the project begins with examination of project details, review of relevant secondary data, determination of the scope of study, survey of current environmental conditions, assessment of impacts, determination of measures and preparation of EIA report. During the study and preparation of report, public participation activities have been conducted through public hearings and receiving feedback from relevant sectors from the very beginning of the study process until the preparation of the EIA report. Opinions and feedback from public hearings are then incorporated into the final report for submission to the ONEP, the EC for their opinions before being forwarded to the NEB and the Cabinet for further consideration and decision.

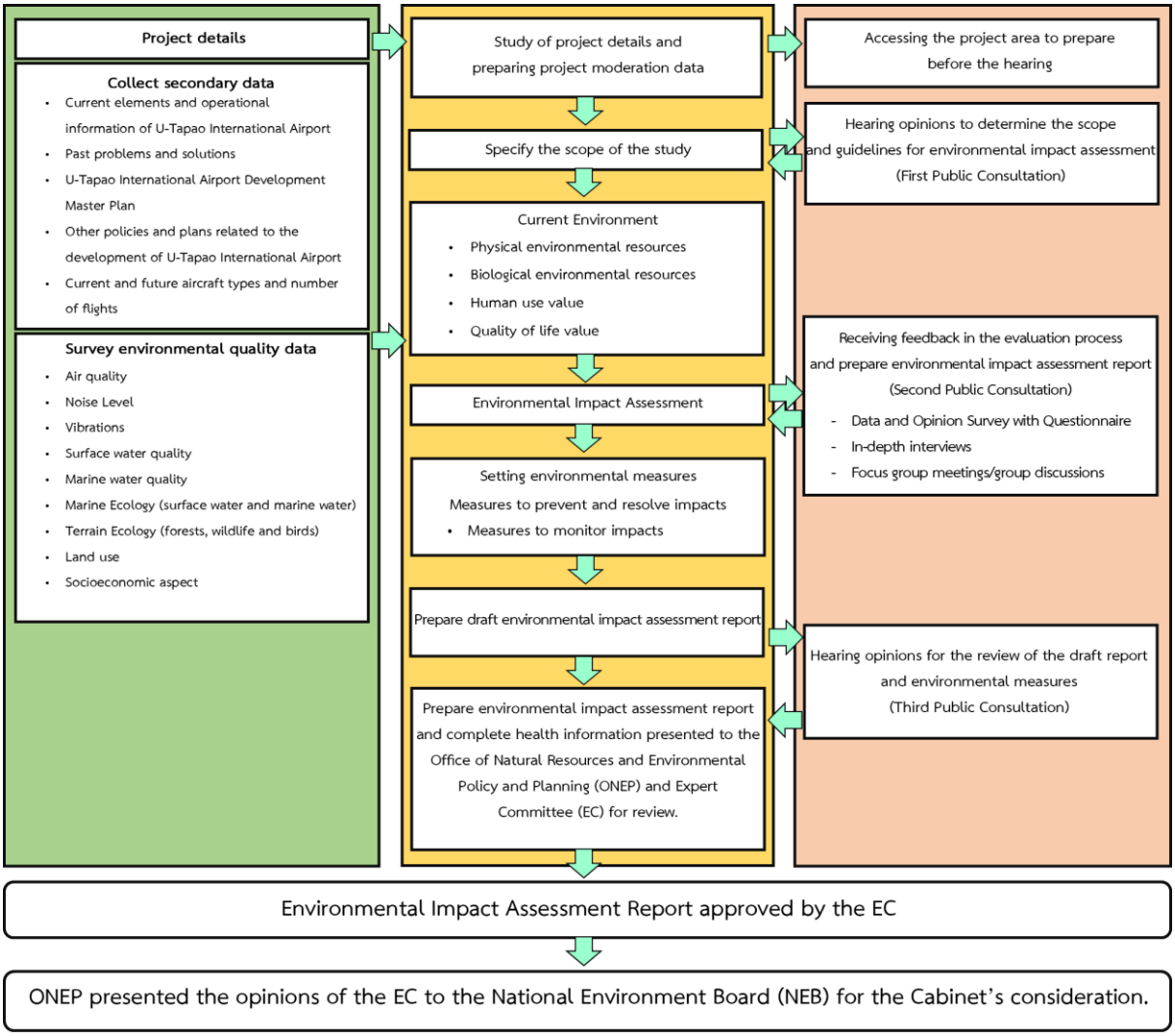



**Figure 1.7 1 Environmental Impact Study Procedures and Scope**

### 1.7.1 Sources of data

For the study, the report on the project master plann, the feasibility study of the development of the U-Tapao Airport and surrounding area in Rayong Province, 2018 were reviewed, along with documents of the central and local governments of the project area and surrounding areas. This is in order to gather project details and activities for further examination, such as project components and activities, location map of project components, such as current public utility and public facility systems, flight handling capacity, types and quantity of waste and waste management, construction plan as well as relevant measures as follows:

1) Full Version of Complete Feasibility Study Master Plan for U-Tapao Airport Development Project and Surrounding Areas, Rayong Province prepared by AECOM Consulting (Thailand) Co., Ltd., December 2018.

2) Airports of Thailand Strategic Plan 2017-2021 (Revised version 2019) was developed by the Department of Airports.

3) Eastern Economic Corridor Development Plan 2017-2021, prepared by the Office of the National Economic and Social Development Board.

4) Overall Eastern Economic Corridor Development Plan 2017-2021, November 2018, prepared by the Office of the Eastern Economic Corridor Office of Thailand.

### 1.7.2 Scrutinization of Project

The project initially reviewed the overall environmental impacts that may arise from project activities based on basic information of the project, demographic data, and nearby communities from the study as well as reports and documents. The impacts identified at this stage may or may not have significant affect the environmental impacts and changes in the health status of people in the communities surrounding the project.

### 1.7.3 Determining the scope of the study

The project has considered the identified impacts in the scrutinization process in order to forecast the potential impacts on the change to natural resources, health and factors determining health of people in communities, identify potential impacts to forecast the likelihood of both positive and negative impacts on natural resources, environment and values and determinants of health status of people in communities surrounding the project. Such impacts cover four aspects of environmental resources, including physical environmental resources, biological environmental resources, human use value and quality of life value. A total of 23 environmental issues are studied as follows:

1) Physical environmental resources include noise, vibration, air quality, topography, geology, earthquake, soil resources, surface water meteorological and air quality, noise, vibration, geology and earthquake, soil resources, surface water hydrology, surface water quality, groundwater quality and seawater quality.

2) Biological environmental resources include terrain ecology and marine ecology.

3) Human use value comprises waste and wastewater management, land use, transportation, public utilities and public facilities (water, electricity and communications) and drainage and flood protection.

4) Quality of life value comprises the economy and society, relocation and replacement of assets, public health (health), occupational health and safety, tourism and scenery, and archaeological and historical sites.

### 1.7.4 Secondary data review and field survey

A review of secondary data and field survey (primary data) to collect and study the environment and health in the area as baseline data prior to the implementation of the project, comparing the trend of the environmental change after the project has been implemented for use in determining the scope of the study on environmental impacts. Basic environmental quality studies are based on data from reports and documents from relevant agencies. Details are shown in **Table 1.7-1**

Study together with additional environmental sampling.

**Table 1.7□1 Study and data collection methods**

| Environmental factors | Study method / sources of data |
|---|---|
| 1) Noise | - Collect and study the results of noise level measurements around the U-Tapao International Airport both from the relevant environmental impact assessment reports and from various agencies.<br>- Study data on level of earth filling in the U-Tapao International Airport area and complaints/noise problems in the areas surrounding the U-Tapao International Airport. |
| 2) Vibration | - Collect and study the results of vibration measurements around U-Tapao International Airport, both from the relevant environmental impact assessment reports. and from various agencies.<br>- Study the complaint/vibration issues in the area surrounding the U-Tapao International Airport. |
| 3) Air quality | - Study rainfall, temperature, direction and speed of wind, atmospheric pressure, relative humidity, and other climatic characteristics in the study area, based on the climatic statistics of the meteorological monitoring stations, which are closest to U-Tapao International Airport that have released current meteorological data.<br>- Collect and study the results of air quality measurements around the U-Tapao International Airport, both from relevant environmental impact assessment reports and from various agencies. |
| 4) Topography | - Study topographical features from the topographic map of Royal Thai Survey Department and Google Earth satellite images.<br>- Study level of earth filling in the U-Tapao International Airport area. |
| 5) Geology and earthquakes | - Study geological characteristics from the geological map of the Department of Mineral Resources.<br>- Study map of earthquake-prone areas of the Department of Mineral Resources.<br>- Collect and study statistics of detectable earthquakes in Thailand of the Meteorological Department. |
| 6) Soil resources | - Study report on the results of the survey on subsidence level in Chonburi and Rayong provinces from the Royal Thai Survey Department and other relevant survey data.<br>- Study the results of the survey on subsidence within the U-Tapao International Airport area. |
| 7) Surface water hydrology | - Study surface water hydrological conditions within U-Tapao International Airport, level of earth filling of U-Tapao International Airport, the flood prevention system of U-Tapao International Airport, |

**Table 1.7□1 Study and data collection methods**

| Environmental factors | Study method / sources of data |
|---|---|
| | canal dredging, water management, and future plans of the Royal Irrigation Department.<br>- Collect and study the highest rainfall data of the meteorological stations located in the U-Tapao International Airport or nearby areas. |
| 8) Surface water quality | - Collect and study data on surface water quality analysis results of the U-Tapao International Airport area and surrounding areas both from relevant environmental impact assessment reports and from agencies.<br>- Collect and study wastewater analysis results before transporting into the central wastewater treatment system of the U-Tapao International Airport and after treatment and discharged from the treatment system. |
| 9) Groundwater quality | - Study the groundwater map of the Department of Mineral Resources.<br>- Compile groundwater well data and groundwater quality analysis results in the area surrounding the U-Tapao International Airport. |
| 10) Marine water quality | - Study project area drainage system, waste water treatment system and management of solid waste and wastewater sludge being generated within the U-Tapao International Airport area.<br>- Collect the data on the results of the seawater quality measurement in the project area. |
| 11) Terrain Ecology | - Collect and study information on terrain ecological survey (forest and wildlife) in the U-Tapao International Airport area and nearby areas.<br>- Collect, study and conduct bird survey and data from the study report on the prevention of bird strike accidents and possible mishaps from other animals in and around the U-Tapao International Airport. |
| 12) Marine ecology | - Compile and study analysis results of marine ecology, such as surface water resources, seawater, in areas surrounding the U-Tapao International Airport from relevant reports. |
| 13) Waste management | - Collect and study all types of waste management data, service scope, as well as service provision capabilities, problems, causes, and plans for waste management in the study area. |
| 14) Land use | - Study the rules on land use according to the integrated town and country planning of Chonburi and Rayong provinces.<br>- Study the map and data of land use around U-Tapao International Airport prior to and after construction of the airport by listing and categorizing types of land use. |
| 15) Transportation | - Study the transportation routes surrounding U-Tapao International Airport and information on land transport policies and plans, |

**Table 1.7□1 Study and data collection methods**

| Environmental factors | Study method / sources of data |
|---|---|
| | transportation systems and future transportation networks in the study area.<br>- Compile statistics on traffic volume of main transportation routes that link up to the project. |
| 16) Public utilities and public facilities (tap water, electricity and communication) | - Collect and study data on supply of tap water and the adequacy for consumption of local people from sources, such as Provincial Waterworks Authority, etc.<br>- Collect and study data on supply of electricity, quantities and issues of electricity consumption of local people from various sources, such as Provincial Electricity Authority, etc.<br>- Compile and study information on communication systems and public use problems from various data sources. |
| 17) Drainage and flooding prevention systems | - Study water drainage conditions, drainage canal size, pumping stations, efficiency and obstacles of drainage systems in U-Tapao International Airport and external drainage systems.<br>- Study information on U-Tapao International Airport's flood prevention system, canal dredging, water management, and future plans of the Royal Irrigation Department. |
| 18) Economic and social | - Collect information on general demographic, social and economic characteristics of the study area.<br>- Collect information on complaints about U-Tapao International Airport operations. |
| 19) Property relocation and replacement | - Survey communities and the number of households in areas surrounding contour zones from the map of the Royal Thai Survey Department and Google Earth satellite photos.<br>- Study NEF contour maps and survey results from communities, buildings, and structures in NEF 30-40 and NEF≥40 areas for compensation and improvements. |
| 20) Health and Public Health | - Collect and study local health status information (cause of illness and rates, cause of death and rates, state of mental health, accident statistics) from related agencies.<br>- Collect and study information on the adequacy and readiness of the health service system, including personnel from related agencies (number of facilities and number of medical and public health professionals). |
| 21) Occupational health and safety | - Collect and study accident/incident data (accident statistics, investigation of accident causes, injury rate)<br>- Collect and study work environment inspection data and industrial hygiene measurements / worker's health check results / risk-based health check results. |
| 22) Tourism and Scenery | - Study information on land travel policies and plans, transportation systems, and future network connections in the study area. |

**Table 1.7-1 Study and data collection methods**

| Environmental factors | Study method / sources of data |
|---|---|
| | - Study the tourism promotion plan in the study area. |
| 23) Archaeological and historical sites | - Collect information; study and inspect important places, archaeological and historical sites both on the ground and underground in the project area; history, importance and origins of landmarks, archaeological and historical site; and conservation guidelines from the Fine Arts Department and related departments. |

### 1.7.5 Environmental Impact Assessment

A forecast of the expected environmental impacts that may arise from project activities both in the construction phase and the operation phase. It considers both positive and negative aspects to cover potential impacts on resources, the environment and various values, as well as connecting the relationships between each impact. Environmental impact forecasting utilizes multiple tools, such as mathematical models, mathematical equations, expert opinions, evidentiary data, etc., which are assessments of the impacts in each area covering the overview of pollution sources or the quality of the existing environment (before the project) and the source of project pollution when considering the environmental characteristics of the study area and the nature of project activities by specifying the scope and assessment guidelines on issues that may affect the environment. Details are as summarized in **Table 1.7-**2.

**Table 1.7-2 Project EIA scope and guidelines**

| Environmental Impact Assessment Scope | Environmental Impact Assessment Guidelines |
|---|---|
| **Noise and Vibration Effects** | |
| Construction Phase | - Study sources or activities that cause noise and vibration, such as land reclamation, transportation of construction materials, workers, construction, and use of machinery.<br>- Study the current noise levels and vibrations at sensitive locations near U-Tapao International Airport which are expected to be affected by construction.<br>- Forecast noise and vibrations at sensitive areas that may be affected, using mathematical equations as a tool.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| Operation Phase | - Study sources or activities that produce significant noise and vibrations from project operations, such as takeoffs-landings, preparation for takeoffs, parking, and aircraft landings, transportation and operations within the airside area, aircraft maintenance, travel, and land transport.<br>- Forecast the increased number of flights and fleet mixes in the future, as well as formulating a study hypothesis covering normal and peak hour |

**Table 1.7□2 Project EIA scope and guidelines**

| Environmental Impact Assessment Scope | Environmental Impact Assessment Guidelines |
|---|---|
| | runway scenarios, as well as runway closure scenarios, in addition to reviewing data on runway use patterns and distribution of runways use and disperse tracks.<br>- Forecast noise levels from the launch of the project using the Aviation Environmental Tool (AEDT) mathematical model as a tool and to show the projected noise level in the form of Noise Exposure Forecast (NEF) contours.<br>- Study the current noise levels and vibrations at sensitive locations near U-Tapao International Airport which are expected to be affected by project operations.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impact on air quality** | |
| Construction Phase | - Consider land reclamation activities, transportation of construction materials, workers, construction, and use of machinery which will cause dust dispersion, including exhaust emissions from machinery and engines.<br>- Study the current air quality of the study area.<br>- Forecast the impact of dust dispersion on the construction site using<br>- mathematical models as a tool (AERMOD (The American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee's Dispersion Model))<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| Operation Phase | - Study the current air quality in the study area before implementing the project.<br>- Study the sources or activities that generate air pollution, such as takeoff-landing preparations, aircraft parking, traveling and land transportation. Major pollutants include exhaust and volatile organic compounds (VOCs) from the combustion of aircraft engine fuel and ground activities such as ground support equipment and auxiliary power units.<br>- Forecast the increased number of flights and fleet mixes in the future, and determine a study scenario that covers runway use during normal use, peak hour and in the case of runway closure.<br>- Use annual flight data, classified by aircraft type on each runway, as input for the Aviation Environmental Tool (AEDT) model to assess air pollution emission rates and import data into the Air Quality Dispersion Modeling (AERMOD) air quality model to assess the spread of air pollutants to show the projected air pollution concentration in the form of air pollutant isopleths. |

**Table 1.7□2 Project EIA scope and guidelines**

| Environmental Impact Assessment Scope | Environmental Impact Assessment Guidelines |
|---|---|
| | - Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on surface water hydrology, surface water quality, groundwater quality, seawater quality, and marine ecology** | |
| Construction Phase | - Study sources or activities that may pollute the direction of surface water flow, surface water quality. groundwater quality, and seawater quality, including marine ecology, such as land reclamation, setting up/building of workers' living quarters, use of water for utilization, consumption, and construction, waste management and wastewater management.<br>- Study of water quality and marine ecology in water sources that support wastewater from construction sites.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| Operation Phase | - Study the supported capacity of wastewater before entering and after passing through the central wastewater treatment system at U-Tapao International Airport. and assess the capability of the central wastewater treatment system at U-Tapao International Airport.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on topography, soil resources, geology and earthquakes** | |
| Construction Phase and Operation Phase | - Study the nature of land reclamation activities for constructing runways, underpasses,and taxiways, and surveying the soil conditions and detailed design of construction, and practice guidelines and control procedures during soil reclamation.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impact on Terrain Ecology** | |
| Construction Phase and Operation Phase | - Study the information status of current terrain ecology conditions of the project area and nearby areas for comparison with past study results to find trends in terrain ecology changes.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on water drainage and flood prevention** | |
| Construction Phase and Operation Phase | - Study the changes in surface water hydrology and drainage due to the adaptation of land use conditions from undeveloped ground to concrete runways.<br>- Assess the operation conditions of the drainage system in the event of heavy rain following the addition of Runway 2, the runway underpass, and parallel taxiways. |

**Table 1.7□2 Project EIA scope and guidelines**

| Environmental Impact Assessment Scope | Environmental Impact Assessment Guidelines |
|---|---|
| | - Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on public utility systems and public facilities** | |
| Construction Phase and Operation Phase | - Forecast water volume demands and electricity demands from project activities.<br>- Assess the water supply and electricity capacity of U-Tapao International Airport.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on wastewater management and waste management** | |
| Construction Phase and Operation Phase | - Forecast the amount of wastewater and waste from sources or project activities, such as from construction activities, from activities of workers in the construction area, from worker camp sites and from employees working within U-Tapao International Airport, as well as future passengers.<br>- Assess the wastewater and waste management capacity of U-Tapao International Airport.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Transportation impacts** | |
| Construction Phase | - Study the number of trips of vehicles used to transport construction materials such as filling soil or sand, equipment, machinery, and workers and activities that may affect transportation.<br>- Study traffic volume on the main transport routes to U-Tapao International Airport.<br>- Forecast the impact on traffic mobility conditions based on the increased number of vehicle trips for construction activities.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| Operation Phase | - Forecast traffic volume and V/C ratios arising from the increased U-Tapao International Airport passenger traffic and cargo transportation volume from project activities in comparison to the absence of the project to analyze and assess traffic conditions on roads around the U-Tapao International Airport area and on the entrance-exit roads.<br>- Compile information about transportation policies around U-Tapao International Airport.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impact on land use** | |

**Table 1.7□2 Project EIA scope and guidelines**

| Environmental Impact Assessment Scope | Environmental Impact Assessment Guidelines |
|---|---|
| Construction Phase and Operation Phase | - Compare land utilization in the U-Tapao International Airport area and determine the type of land use.<br>- Study the trend of land utilization around U-Tapao International Airport and assess the impact of land use in noise affected areas from projected NEF contour results for the opening of Runway 2.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on tourism and scenery** | |
| Construction Phase and Operation Phase | - Assess the impact on ease of access to tourist attractions (accessibility) in the area near U-Tapao International Airport.<br>- Assess visual absorption capability and assess sensitivity of perception to changes in scenery (visual sensitivity) to assess the environmental impacts in scenery arising from the project on the environment.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Economic and social impacts** | |
| Construction Phase | - Study the construction activities that may cause socioeconomic impacts, both positive and negative, such as transportation of materials, construction equipment, and workers, and setting up of worker's living quarters.<br>- Forecast impacts on socioeconomic changes such as employment, social problems, and drug problems, as well as disturbances and living inconveniences.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| Operation Phase | - Assess potential impacts of project activities on economic and social conditions in the study area, both positive and negative, such as employment, travel, land transport, wastewater management, sewage, drainage and flood prevention, waste management, etc.<br>- Forecast impacts on economic and social changes, both positiveand negative, such as economic benefits, community expansion, latent population problems, and anxiety about the impacts, especially noise.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on resettlement and replacement of assets** | |
| Operation Phase | - Study the results of forecasted noise levels after opening Runway 2 at sensitive areas near U-Tapao International Airport that are expected to be affected by project implementation. |

**Table 1.7-2 Project EIA scope and guidelines**

| Environmental Impact Assessment Scope | Environmental Impact Assessment Guidelines |
|---|---|
| | - Survey affected communities/properties in the NEF ≥40 and NEF 30 - 40 areas for compensation or improvement, to set up a budget for paying compensation using the guidelines per the Cabinet resolution dated 29 May 2007.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impacts on health, public health, occupational health and safety in the issue of accidents, disasters, and public safety** | |
| Construction Phase and Operation Phase | - Identifying and classifying activities that pose a risk of danger to the public from operations such as runway preparations, takeoff and landing, aircraft landings and parking, transportation and operations within the aviation operating zone, aircraft maintenance, travel, land transport, etc.<br>- Assess the risk of danger to the public<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| **Impact on archaeological and historical sites** | |
| Construction Phase | - Assess noise levels, vibrations, and the impacts from dust arising from construction activities on archaeological sites and religious places near the project construction site.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |
| Operation Phase | - Compose a map that shows the location of archaeological sites and religious places in the project study area overlaid with the forecasted operation phase NEF contour lines obtained from mathematical models.<br>- Compose a map that shows the location of archaeological sites and religious places in the project study area overlaid with the forecasted dust isopleths from mathematical models.<br>- Analyze impacts on archaeological sites and religious places that may be affected by wingtip vortices.<br>- Determine impact prevention and resolution measures and environmental impact monitoring measures. |

### 1.7.6 Health Impact Assessment

Health impact assessments focus on forecasting impacts on health status as a result of project implementation, considered based on links between project details and information on the current environment in the study area. The scope of the health impact assessment considers both environmental and social health determinants. The scope of the forecasts considers how development activities may influence changes in the health determinants of people in communities surrounding the project. The scope of the study on occupational health and safety

impacts covers employees working in the project from project screening and study scoping under the scope of secondary data and baseline information existing before the project. The health risk assessment principle is then used to predict the severity of the impacts and the likelihood of such impacts. The results of the impact assessments lead to the formulation of measures to prevent and correct impacts as much as possible and to determine measures for monitoring the impacts.

The quantitative risk analysis uses air pollution emission data to assess the spread of the substances, substance exposure and reactions, and risk level/characteristics to forecast the magnitude of health impacts, divided into cancer risk and the risk of causing diseases other than cancer. The qualitative risk assessment assesses the level of impact based on likelihood and consequences. The likelihood of an impact is determined by the probability of the occurrence of that event and the opinions of health professionals, and the severity of the consequences are determined by the main issues of the risk group, considered from susceptibility/sensitivity to exposure due to immunological factors, the development of the physiological system in the body, and the resulting loss and damage. This is considered based on morbidity/mortality rate, the number of injuries, the severity of such damages, and physical damage, such as the amount and degree of damage to public utilities, need for emergency care, community safety and the impacts on environmental health in the community, and competencies of relevant agencies, such as public health agencies in the area, local administrative organizations, etc.

### 1.7.7 Public hearing and public participation

Project public hearings and public participation activities have followed the guidelines specified in the Guidelines for Public Participation in the Procedure of Providing an Environmental Impact Assessment Report from the Office of Natural Resources and Environmental Policy and Planning (ONEP) (8 January 2019). The operating procedures are as follows:

1) Identifying stakeholder groups
2) Prioritize stakeholders
3) Entering the project area for preparation before the hearing
   - Meeting for preliminary information and discussions
   - Entering the area to provide information to the people
4) Implementation of Public Consultation Process
   - First Public Consultation : The process of listening to the opinions of the public and stakeholders to determine the EIA scope and guidelines.
   - Second Public Consultation : The process of listening to the opinions of the public and stakeholders in the assessment process and in preparing the EIA report.

     - Data and opinion surveys using questionnaires
     - In-depth interviews
     - Focus group meetings/group discussions

- Public Consultation No.3 : Stakeholder and public hearing process in the review of the environmental impact assessment report, environmental impact prevention and resolution measures and environmental impact monitoring measures.

### 1.7.8 Public relations

Public relations disseminate information about the project. It is extremely important to create awareness and understanding among the target audience and the public. Therefore, there has been a variety of public relations communication operations, including: public relations via various public media such as television, radio, and publications to create wider awareness; public relations via posters, public relations, brochures, exhibition boards and websites for quick access to information and responses; relying on mass communication coalitions in the project area to coordinate and jointly define guidelines and strategies used in public relations, preparation of general public relations and emergency plans, plans for using public relations media and preparing plans to support relationship-building with the media, as well as evaluating project participation and public relations performance for proactive public communication and appropriate forms of community participation.

### 1.7.9 Proposal of Environmental Impact Prevention and Resolution Measures

The following guidelines are used to consider and propose environmental impact prevention and resolution measures for the project:

1) Study and review the measures to prevent and correct impacts from current project operations and consider them in conjunction with determining project measures in both the construction phase and the operation phase. The proposed measures include measures that should be added or improved.

2) Recommend measures and methods to prevent and correct environmental impacts that are appropriate for the nature and severity of the impacts that are practical for application for both the environmental and health issues that are expected to be impacted and to change to exceed standard ranges determined for the construction phase and operation phase. Clearly specify the details of the measures, as well as the budget for operating in accordance with the proposed measures. In addition, if there are some issues that are expected to have unavoidable consequences, propose compensation measures for the arising damages in the study. However, if it is found that some issues may have minimal impacts but may be possible to propose a way to improve or promote the quality of the environment and health in the project surroundings to become better than before, such guidelines and measures are proposed for the benefit of the project and stakeholders in the future.

### 1.7.10 Proposal of Environmental Impact Monitoring Measures

The health and environmental impact monitoring measures for both the construction phase and operation phase have important objectives for monitoring changes in environment and health status and to monitor the effectiveness per the impact prevention and resolution measures proposed to the Royal Thai Navy (RTN) and the EECO as the main units jointly responsible for project implementation. Such impact monitoring measures are used as data for surveillance of

impacts expected to arise from the project and used as information to improve project operations and to improve environmental measures for future projects to become more suitable.

### 1.7.11 Composing of Environmental Action Plan

Consider implementing Environmental impact prevention and resolution measures and impact monitoring measures to create an environmental action plan for the project during the construction phase and operation phase. Moreover, consider applying public relations and public participation measures in the determination of the action plan. In this regard, the Action Plan consists of principles and rationale, objectives, indexes, operational areas, operational procedures, and operating periods. The agency is responsible for preparing and managing the plan, as well as the operation budget for the responsible agency to implement the action plan to completion and with efficiency.

## 1.8 Laws, policies, and regulations related to the project's environmental impact study

In the project's environmental impact study, relevant laws and regulations were reviewed as summarized in **Table 1.8-1**

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| 1. Constitution of the Kingdom of Thailand, 2017 | - Section 58 specifies that any undertaking by the State or which the State will permit any person to carry out, if such undertaking may severely affect the natural resources, environmental quality, health, sanitation, quality of life or any other essential interests of the people or community or environment, the State shall undertake to study and assess the impact on environmental quality and health of the people or communities and shall arrange a public hearing of relevant stakeholders, people and communities in advance in order to take them into consideration for the implementation or granting of permission as provided by the law. |
| 2. Enhancement and Conservation of National Environmental Quality Act, 1992 | - This Act is considered the main environmental law governing various activities of Thailand, including setting environmental standards; determining the essence for pollution control and reduction; restoration of natural resources in the event of damage; environmental impact analysis; environmental planning; public participation; decision-making procedures; and the powers and duties of the National Environment Board |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| 3. Enhancement and Conservation of National Environmental Quality Act (No. 2) 2018 | - Additional amendments to the Enhancement and Conservation of National Environmental Quality Act 1992, updating provisions relating to the preparation of EIA reports and environmental impact assessment systems in accordance with the provisions of the Constitution of the Kingdom of Thailand in Chapter 3 Environmental Protection, Section 4 Environmental Impact Assessment Report, which has modified the term "Environmental Impact Analysis Report" to "Environmental Impact Assessment Report", which requires an environmental impact assessment report to be prepared containing at least the essential details of the project or activities or operations; current environmental conditions; evaluation of operation options; assessment of environmental impacts that may occur from a project or activity or operation, both directly and indirectly; public participation in environmental impact assessments and measures to prevent and correct environmental impacts; and compensation for suffering or damage. Also, for projects or undertakings or operations by the State or which the State will permit any person to carry out, if such undertaking may severely affect the natural resources, environmental quality, health, sanitation, quality of life or any other essential interests of the people or community or environment, the operator or applicant shall undertake to study and assess the impact on environmental quality and health of the people or communities and shall arrange a public hearing of relevant stakeholders, people and communities as prescribed by the rules, procedures, and conditions prescribed by the Minister with approval from the National Environment Board in addition to the actions under paragraph two. |
| 4. Announcement of the Ministry of Natural Resources and Environment Re: Specifications for Projects, Businesses or Operations that May Severely Impact Natural Resources, Environmental Quality, and the Health, Sanitation, and Quality of Life of People in the Community, in which an environmental impact | - This announcement is issued under the provisions of Section 48 and Section 51 of the Enhancement and Conservation of National Environmental Quality Act 1992, as amended by the Enhancement and Conservation of National Environmental Quality Act (No. 2) 2018 to repeal all original notifications that have been announced and for compliance with the provisions of this notification instead. Essential amendments include explanations for various definitions, project types, criteria, and methods |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| assessment report must be composed, along with the criteria, procedures, and conditions for the Environmental Impact Assessment Report 2018 | and conditions for preparing an environmental impact assessment report. Guidelines have been determined for preparing the Environmental Impact Assessment Report for Projects, Businesses or Operations that May Have Severe Impacts on Natural Resources, Environmental Quality, Health, Sanitation, and Quality of Life of People in the Community, in which a process must be established for hearings to listen to the public and stakeholders. The person preparing the report under this notification must be licensed to prepare an environmental impact assessment report and registered with ONEP. |
| 5. Announcement of the Ministry of Natural Resources and Environment Re: Specifications for Projects, Businesses or Operations that May Severely Impact Natural Resources, Environmental Quality, and the Health, Sanitation, and Quality of Life of People in the Community, in which an environmental impact assessment report must be composed, along with the criteria, procedures, and conditions for the Environmental Impact Assessment Report (No. 2) 2019 | - This is an additional amendment that repeals the text in No. 8 (Air Transport Systems) and No. 9 (Berth) of Attachment 1 to the Notification of the Ministry of Natural Resources and Environment Re: Specifications for Projects, Businesses or Operations that May Severely Impact Natural Resources, Environmental Quality, and the Health, Sanitation, and Quality of Life of People in the Community, which requires that an EIA report is prepared with the criteria, methods, and conditions of the EIA report dated 19 November 2018, which states "No. 8 Air transport system projects with expansion constructions or additions of runways from 3,000 meters onwards", to be changed to "No. 8 Air transport systems, applicable only to airport constructions or expansions, or to temporary takeoff and landings of aircrafts in accordance with the law on air navigation, for runways with a length of 3,000 meters onwards." |
| 6. Notification of the Office of Natural Resources and Environmental Policy and Planning, Re: Guidelines for Public Participation in the Procedure of Providing an Environmental Impact Assessment Report 2019. | - This is an update to the Guidelines for Public Participation in the Procedure of Providing an Environmental Impact Assessment Report for suitability and consistency with the provisions of the Enhancement and Conservation of National Environmental Quality Act (No. 2) 2018. |
| 7. National Health Act 2007 | - Section 1, Section 11: An individual or a group of people has the right to request an assessment and participate in the assessment of health impacts resulting from a public policy. An individual or a group of people shall have the right to acquire information, explanation and underlying reasons from a state agency prior to approval or |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| | implementation of a project or undertaking that may affect their health or the health of the community, and shall have the right to express their opinion on such matter. |
| 8. Announcement of the National Health Commission Re: Criteria and Methods for Assessing Health Impacts Caused by Public Policy 2009 | - This announcement is issued under the authority of section 25, paragraph one (5) of the National Health Act 2007. Part 3 is for health impact assessments procedures per Chapter 1 of the announcement, for projects or activities that may cause severe impacts in terms of environmental quality, natural resources and health per Section 67 of the Constitution of the Kingdom of Thailand 2007, which requires operations to comply with the health impact assessment guidelines in the Environmental Impact Assessment of Thailand report prepared by the Office of Natural Resources and Environmental Policy and Planning, which requires the addition of<br>1) a public scoping procedure to define the scope and guidelines for public health impact assessments.<br>2) Determine the factors to be studied, which must at least cover factors that may affect health in Addendum 1.<br>3) Organize a forum to review the draft EIA report (public review). |
| 9. Compensation Act, 1994 and (No. 2), 2018 | - This is a provision that protects employee benefits in relation to the scope of law enforcement; status and responsibilities of business operators and contractors; and determination of criteria, methods, conditions and rates of medical payments, rehabilitation expenses, funeral expenses, compensation and additional money in case the employer fails to pay contributions or does not pay the full amount. This also includes rules for submitting an employer registration form; notification of danger, sickness or disappearance; and filing a request for compensation, etc. There is also a notification of the Ministry of Labor, Re: Determination of the Types of Diseases Occurring due to the Nature or Conditions of Work or Due to Work, 2007, dated 24 July 2007 |
| 10. Labor Protection Act 1998<br>(No. 2), 2008<br>(No. 3), 2008<br>(No. 4), 2010<br>(No. 5), 2017 | - Labor protection laws define the rights and duties of employers and employees by setting minimum standards in the use of labor and the payment of remuneration at work to allow employees to work safely, have good health and receive reasonable remuneration and welfare. |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| (No. 6), 2017<br>(No. 7), 2019 | This is to ensure the best use of labor for employers, employees and the country. |
| 11. Occupational Safety, Health and Environment Act 2011 | - This Act is a law to regulate various business establishments in the country in terms of occupational safety, health and environment. In essence, in Chapter 1, General Provisions, Section 6, an Employer is obligated to provide and keep an Establishment and an Employee in safe and hygienic working conditions and environment including to support and promote an operation of the Employee preventing the Employee from any harm on life, physique, mentality and health. The Employee is obligated to cooperate with the Employer in operating and promoting of occupational safety, health and environment in order to ensure safety to the Employee and the Establishment. Also, in Chapter 4, Control, Supervision and Administration, Section 32, for the purpose of control, supervision and administration operations on occupational safety, health and environment, an employer shall perform as follows:<br>1) Conduct hazard assessments.<br>2) Study the impacts of working conditions that affect employees.<br>3) Prepare action plans on occupational safety, health, and environment and a control plan for employees and the establishment.<br>4) Submit the results on the hazard assessment, impact study, action plan and control plan under (1), (2) and (3) to the Director-General or a person entrusted by the Director-General.<br>- Ministerial rules and announcements under the Occupational Safety, Health and Environment Act 2011 are as follows:<br>1) Ministerial Regulations prescribing standards for the administration, management and operation of occupational safety, health and environment in relation to hazardous chemicals<br>, 2013<br>2) Announcement of the Department of Labor Protection and Welfare Re: List of Hazardous Chemicals 2013 |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| | 3) Announcement of the Department of Labor Protection and Welfare Re: Hazardous Chemical List Form and Details of Safety Information of Hazardous Substances, 2013<br>4) Announcement of the Department of Labor Protection and Welfare Re: Criteria, Methods and Conditions for Training Executives, Supervisors and Employees on Occupational Safety, Health and Environment , 2012<br>5) Ministerial Regulations Determining Standards for Administration, Management and Operations on Occupational Safety, Health and Environment Relating to Heat, Light and Noise, 2016 |
| 12. Requirements of the Civil Aviation Authority of Thailand No. 14 on Airport Standards, 2019 | - These requirements are related to airport management and enforced in airports serving the public located on the ground, consisting of a common reference system, public airport operations certification, airport design, airport-specific operating procedures, and airport maintenance. |
| 13. Announcement of the Ministry of Transport Re: Determination of Areas Nearby Rayong-U-Tapao International Airport in the area of Bang Lamung District, Sattahip District, Chonburi Province and Ban Chang District, Rayong Province, as Air Safety Zones 1995 | - This announcement defines areas nearby Rayong-U-Tapao International Airport in Huai Yai Subdistrict, Bang Lamung District, Bang Sare Subdistrict, Phlu Ta Luang Subdistrict, Sattahip Subdistrict, Sattahip District, Chonburi Province and Sam Nak Thon Subdistrict, Phala Subdistrict, Ban Chang Subdistrict, Ban Chang District, Rayong Province, within the boundary lines per the map attached to this announcement, as air safety zones. |
| **Related environmental standards** | |
| 14. General Atmospheric Air Quality Standards<br>- Announcement of the National Environment Board No. 10 (1995) Re: Determination of General Atmospheric Air Quality Standards<br>- Announcement of the National Environment Board No. 21 (2001) Re: Determination of 1-Hour General Atmospheric Sulfur Dioxide Standards | Used for comparison with current environmental quality and to assess potential impacts in the future. |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| - Announcement of the National Environment Board No. 24 (2004) Re: Determination of General Atmospheric Air Quality Standards<br>- Announcement of the National Environment Board No. 28 (2007) Re: Determination of General Atmospheric Air Quality Standards<br>- Announcement of the Pollution Control Department Re: Determination of Surveillance Values for Volatile Organic Compounds in the General Atmosphere within 24 Hours<br>- Announcement of the National Environment Board No. 33 (2009) Re: Determination of General Atmospheric Nitrogen Dioxide Standards<br>- Announcement of the National Environment Board No. 36 (2010) Re: Determination of General Atmospheric PM2.5 Standards | |
| 15. Noise level standards<br>- Announcement of the National Environment Board No. 15 (1997) Re: Determination of General Sound Level Standards<br>- Notification of the National Environment Board No. 29 (2007) Re: Noise Level Values<br>- Notification of the Pollution Control Department Re: Noise Level Calculations (Announced on August 11, 1997)<br>- Notification of the Pollution Control Board Re: Methods for | |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| Measuring Baseline Noise Levels and Noise Levels without Disturbances, Measuring and Calculating Noise Levels with Disturbances, and Measurement Record Form (31 August 2007) | |
| 16. Vibration level standards<br>- Announcement of the National Environment Board No. 37 (2010) Re: Determination of Vibration Standards to Prevent Impacts on Buildings | |
| 17. Hazardous waste management<br>- Notification of the Ministry of Industry, Re: Hazardous Waste Transportation Documentation System, 2004<br>- Notification of the Ministry of Industry Re: Disposal of Sewage or Unused Materials, 2005 | |
| 18. Wastewater Quality Standards<br>- Announcement of the Ministry of Natural Resources and Environment Re: Determination of Standards to Control Wastewater from Certain Types and Sizes of Buildings 2005<br>- Notification of the Ministry of Industry Re: Determination of Standards to Control Wastewater Drainage from Factories, 2017<br>- Ministerial regulations prescribing rules and procedures, with a form for collecting statistics and information about creating a detailed record and a summary report on the performance of the | |

**Table 1.8-1 Laws and regulations related to the project's environmental impact study**

| Related Laws | Overview |
|---|---|
| wastewater treatment system, 2012. | |
| 19. Employee Health Examination Standards<br>- Ministerial Regulations prescribing guidelines and methods for employee health examinations and for submitting examination results to labor inspectors, 2004<br>- Announcement of the Department of Labor Protection and Welfare Re: Determination of Criteria and Methods for Employee Health Examinations and Health Examination Report Form for Employees Working with Hazardous Chemicals 1992 | |

## 1.9 Environmental Impact Assessment Report Content

The project environmental impact assessment report consists of 7 chapters as follows:

Chapter 1 Introduction

Chapter 2 Project Details

Chapter 3 Environment Conditions

Chapter 4 Public Participation and Public Relations

Chapter 5 Environmental Impact Assessment

Chapter 6 Health Impact Assessment

Chapter 7 Environmental Action Plan, Environmental Impact Prevention and Resolution Measures, and Environmental Impact Monitoring Measures