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February 13, 2019

Ms. Amy Sweeney
Director, Division of Natural Gas Regulation
Office of Fossil Energy
U.S. Department of Energy
Room 3E-052
1000 Independence Ave S.W.
Washington, DC 20585

Re: *Energía Costa Azul, S. de R.L. de C.V.*
FE Docket Nos. 18-144-LNG (ECA Mid-Scale Project)
Project Update – Information Regarding Permitting and Commercial Developments

Dear Ms. Sweeney:

On September 27, 2018, Energía Costa Azul, S. de R.L. de C.V. ("ECA") filed an application with the Department of Energy's Office of Fossil Energy ("DOE/FE") in FE Docket No. 18-144-LNG, requesting long-term multi-contract authorization to export natural gas to Mexico and to re-export liquefied natural gas ("LNG") from Mexico to Free Trade Agreement ("FTA") and non-FTA nations in a volume up to a total of 180 billion cubic feet per year ("Bcf/yr") of natural gas and 161 Bcf/yr of LNG from ECA's liquefaction and export terminal facilities to be located north of Ensenada, Baja California, Mexico ("ECA Mid-Scale Project").[1]

Also on September 27, 2018, ECA filed an application with DOE/FE in FE Docket No. 18-145-LNG, requesting long-term multi-contract authorization to export natural gas to Mexico and to re-export LNG from Mexico to FTA and non-FTA nations in a volume up to a total of 545 Bcf/yr of natural gas and 475 Bcf/yr of LNG from a separate project to be located at ECA's Ensenada terminal facilities ("ECA Large-Scale Project").[2]

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[1] Energía Costa Azul, S. de R.L. de C.V., Application for Long-Term, Multi-Contract Authorizations to Export Natural Gas to Mexico and to Export Liquefied Natural Gas from Mexico to Free Trade Agreement and Non-Free Trade Agreement Nations (ECA Mid-Scale Project), FE Docket No. 18-144-LNG (Sep. 27 2018) ("Mid-Scale Application").

[2] Energía Costa Azul, S. de R.L. de C.V., Application for Long-Term, Multi-Contract Authorizations to Export Natural Gas to Mexico and to Export Liquefied Natural Gas from Mexico to Free Trade Agreement and Non-Free Trade Agreement Nations (ECA Mid-Scale Project), FE Docket No. 18-145-LNG (Sep. 27 2018) ("Large-Scale Application").

In further support of the non-FTA portion of the export applications for the ECA Mid-Scale Project and the ECA Large-Scale Project, ECA submits this update related to the status of Mexican permits for both projects.

As ECA noted in its September 27, 2018 export applications in the captioned proceedings, ECA has submitted applications with the relevant federal, state, and local authorities in Mexico for the construction and operation of both the ECA Mid-Scale Project and the ECA Large-Scale Project. As of the date of its applications, ECA had obtained all but one of the relevant environmental authorizations from the applicable Mexican agency. On August 30, 2018, ECA submitted a filing with the *Agencia Nacional de Seguridad Industrial y de Protección al Medio Ambiente del Sector Hidrocarburos* / Environmental and Safety Agency for the Hydrocarbon Industry ("ASEA") seeking to modify ECA's previously-issued environmental authorization to permit it to construct both the ECA Mid-Scale Project and the ECA Large-Scale Project. Specifically, the authorization that ECA had obtained at the time of its export applications had contemplated a single, 12.4 mtpa project. The requested modification would permit the construction of the 3.3 mtpa ECA Mid-Scale Project and the 9.1 mtpa ECA Large-Scale Project as separate undertakings.[3] On December 12, 2018, ASEA issued a resolution granting the modification to ECA's environmental permit as requested. ECA also notes that on December 13, 2018, the *Comisión Reguladora de Energía* / Energy Regulatory Commission of Mexico ("CRE") issued a resolution modifying ECA's previously-issued liquefaction authorization to allow the ECA Mid-Scale Project and ECA Large-Scale Project to proceed as two separate undertakings. English translations of the ASEA and CRE resolutions are attached to this letter.

With the issuance of these permit modifications, ECA now has in place all necessary key federal Mexican environmental authorizations to construct and operate the liquefaction terminal facilities for the ECA Mid-Scale Project and the ECA Large-Scale Project.

ECA also notes that substantial progress has been made in the commercial development of the ECA Mid-Scale Project. Specifically, in November 2018, it was announced that heads of agreements have been signed with three potential customers for the negotiation of sales and purchase agreements for the full capacity of the ECA Mid-Scale Project. Given these developments, ECA urges the DOE/FE to act expeditiously to grant the approvals as requested in ECA's application in this proceeding.[4]

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[3] *See* Mid-Scale Application at 6, 9, App'x C; Large-Scale Application at 6-7, 9-10, App'x C.

[4] Press Release, *Sempra Energy Units Sign Three Heads Of Agreements With Total S.A., Mitsui & Co., Tokyo Gas Co. For Energía Costa Azul Liquefaction Project* (Nov. 7, 2018), *available at* https://www.sempra.com/newsroom/press-releases/sempra-energy-units-sign-three-heads-agreements-total-sa-mitsui-co-tokyo-0.

If you have any questions regarding this submission, please do not hesitate to contact me.

Respectfully submitted,

/s/ Jerrod L. Harrison

Jerrod L. Harrison

Counsel for Energía Costa Azul, S. de R.L. de C.V.

cc: Brett A. Snyder, Blank Rome LLP

Attachments

SEMARNAT
SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES

ESTADOS UNIDOS MEXICANOS

ASEA
AGENCIA DE SEGURIDAD, ENERGÍA Y AMBIENTE

National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector.

NOTICE TO APPEAR DOCUMENT

In Mexico City, at 12:23 hours on DECEMBER 12, 2018, the undersigned, María del Pilar Sabina Camarillo Estrada, personnel member assigned to the Industrial Management Unit, who identifies herself hereby with an official credential issued by the National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector, with number 3212, being present at the property marked as No. 4209, Boulevard Adolfo Ruiz Cortines, Colonia Jardines en la Montaña, Del. Tlalpan, CP, 14210, Mexico City, attends the present proceeding with (the) C. ALVARO MIGUEL PINTO FAJER who is identified with a VOTING CREDENTIAL with photograph, with ELECTOR CODE PNFJAL92041509H900, issued in his name by THE NATIONAL ELECTORAL INSTITUTE, and which was seen first-hand, declaring to be AUTHORIZED TO HEAR AND RECEIVE NOTIFICATIONS, thus based on Article 35 in the Federal Law of the Administrative Procedure, they are hereby notified and provided with official document number ASEA/UGI/DGGPI/2231/2018, dated NOVEMBER 15, 2018, issued by Eng. David Rivera Bello, in his capacity as General Director for Industrial Processes Management, which is composed of 67 pages of text respectively.

Having nothing further to add, this formality is rendered concluded at 12:30 hours on the same day, with the signatures of those who participated therein, leaving a copy of this notification document to the relevant person.

NOTIFYING PARTY	**PERSON BEING NOTIFIED**
_____	_____
María del Pilar Sabina Camarillo Estrada	**Name and signature**

A previously-verified non-certified copy of the following original documents are attached hereto:

- ☒ Voting card
- ☐ Passport
- ☐ Professional Certificate
- ☐ Other. Specify _____

Mexico City, November 15, 2018

C. MARÍA CRISTINA KESSEL ENRÍQUEZ
LEGAL REPRESENTATIVE FOR THE COMPANY
ENERGÍA COSTA AZUL, S. DE R.L. DE C.V.
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File: 02BC2016G0068.
Log: 09/DGA0452/08/18.
Folio: 013116/10/18

With reference to the unnumbered written document dated August 30, 2018, filed with the National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector, hereinafter referred to as the **AGENCY** on the same day and submitted to this General Directorate of Industrial Processes Management (**DGGPI**, for its abbreviation in Spanish); whereby, in their capacity as Legal Representative for the company **ENERGÍA COSTA AZUL, S. DE R.L. DE C.V.**, hereinafter referred to as the **REGULATED PARTY**, filed the request for modification, corresponding to the project **"NATURAL GAS LIQUEFACTION PROJECT AT ENERGÍA COSTA AZUL, S. DE R.L. DE C.V."**, located in the Municipality of Ensenada, in the State of Baja California.

Based on the foregoing, and once the information submitted by the **REGULATED PARTY**, as well as the information contained in the administrative file of the **PROJECT** has been assessed, and

WHEREAS

I. The **PROJECT** was analyzed and assessed through a regional-modality Environmental Impact Statement (**MIA-R**, for its abbreviation in Spanish) and the Environmental Risk Study (**ERA**, for its abbreviation in Spanish); therefore, the **DGGPI** issued official document number ASEA/UGI/DGGPI/0233/2017, dated November 30, 2017, by means of which it was resolved to authorize it conditionally, granting a term of **10 years** for the site preparation and construction activities, and **30 years** for the operation, maintenance, and abandonment of the **PROJECT**.

II. On February 15, 2018, the **REGULATED PARTY** submitted a modification to the **PROJECT**, in which it requested the following:

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- A reduction in the non-cleared surface area at the Regasification Plant from 2.53 to 2.13 ha, which is intended mainly for services and workshops.

- A reduction in the parking surface from 0.61 to 0.54 ha.

- A change of location of the surface intended for redensification and natural vegetation, in accordance with the following:

  a) A change of location of a 25.01 ha surface intended for the activity proposed in Mitigation Measure MV-02 of the Authorized **PROJECT** "Area for redensification, through reforestation, the Preservation Areas of the Regasification Plant that allow it", to a polygon within the same ecosystem (El Mirador) determined in the Polygonal Area of the Authorized **PROJECT**.

  b) A change of location of a 2.47 ha surface with Natural Vegetation to a polygon within the same ecosystem determined in the Polygonal Area of the Authorized **PROJECT**.

The modification was authorized under official document ASEA/UGI/DGGPI/0306/2018, dated February 28, 2018.

III. On October 16, 2018, the **REGULATED PARTY** submitted a modification to the **PROJECT**, in which it requested the following:

1. To have a territorial reserve for future projects within the Polygonal Area of the Authorized Project. This area is referred to as the Polygonal Area of a future project, which has a surface of 262,099.95 m^2 (26.21 ha).

2. The relocation of approximately 2.34 ha intended for activities proposed in Mitigation Measure MV-01 of the Authorized Project, to approximately 2.34 ha intended for the Redensification of areas with available natural vegetation outside the Preservation areas of the Regasification Plant (Mitigation Measure MV-02 activity).

   - MV-01: "*Rescue individual cactus species in the areas that will be cleared due to Project development*...".
   - MV-01: "*Rescue individual Ferocactus viridescens that were transplanted in compliance with the Regasification Plant's Wild Flora Rescue, Protection, and Preservation Program, which are found in the areas to be cleared due to Project development...*".

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3. Change of location of 19.19 ha; this surface takes into account the 2.34 ha described previously, intended for the activities proposed in Mitigation Measure MV-02 of the Authorized Project, to a polygon within the same ecosystem determined in the Polygonal Area of the Authorized Project:

   - MV-02: "*Maintain the natural vegetation in areas identified with slopes, where it is not possible to carry out reforestation activities* ".
   - MV-02: Area to "*Redensify, through reforestation, the Preservation Areas of the Regasification Plant that allow it...*".
   - MV-02: Area to "*Redensify, through reforestation, areas with natural vegetation available outside the Preservation Areas of the Regasification Plant*".

4. Change of location from 0.85 ha with Natural Vegetation to a polygon within the same ecosystem determined in the Polygonal Area of the Authorized Project.

The modification was authorized under official document ASEA/UGI/DGGPI/2136/2018, dated October 26, 2018.

IV. On August 30, 2018, the **REGULATED PARTY** requested a **PROJECT** modification to this **DGGPI**, since it needs to reconfigure the authorized train capacity, for which it will require a third liquefaction train with a lesser capacity (3.29 MTPA) and decrease the capacity of the two authorized liquefaction trains from 6.175 MTPA to 4.53 MTPA.

V. As a result of the analysis carried out by this **DGGPI**, insufficiencies were detected in the information submitted; therefore, by means of official document ASEA/UG1/DGGP1/1814/2018, dated September 12, 2018, additional information was requested from the **REGULATED PARTY**.

VI. On October 31, 2018, by means of written document ECAL/018/18, the **REGULATED PARTY** submitted to this **DGGPI** a response with the additional information requested through official document ASEA/UGI/DGGPI/1814/2018, dated September 12, 2018.

VII. This **DGGPI** proceeds to determine the procedure in accordance with the powers conferred thereto in the Internal Regulations for the National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector, the **LGEEPA,** and its **REIA**.

WHEREAS:

I. This **DGGPI** is empowered to analyze, assess, and resolve the petition presented by the **REGULATED PARTY**, in accordance with Article 10 of the **AGREEMENT,** by which the General Directorate of Industrial Processes Management is delegated the powers published in the Official Gazette of the Federation on November 30, 2017, and in Articles 4, Fraction XIX, 18 Fraction III, and 29, Fractions XIX and XX, of the Internal Regulations for the National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector.

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II. The **REGULATED PARTY** performs natural gas liquefaction; therefore, its activity corresponds to the Hydrocarbons Sector, which is within the scope of this **AGENCY** in accordance with the definition indicated in Article 3, Fraction XI, Item c), of the National Industrial and Environmental Safety Agency Act of the Hydrocarbons Sector.

III. Article 28 of the Regulations for the General Law of Ecological Balance and Environmental Protection for Environmental Impact Assessment (REIA, for its abbreviation in Spanish) stipulates the assumptions to be considered when attempting to make modifications to the **PROJECT** after the Environmental Impact authorization has been issued, which reads verbatim:

> "*I. If it is necessary to submit a new Environmental Impact Statement;*
>
> *II. If the proposed modifications do not affect the content of the authorization granted, or*
>
> *III. If the authorization granted needs to be modified in order to impose new conditions on performing the works or activity in question".*

IV. The **REGULATED PARTY** described in official document ECAL/016/18, dated August 30, 2018, and in ECAL/018/18, dated October 31, 2018, the works it intends to carry out for the **PROJECT**, which consist of:

- A reduction of 1,645 MTPA in the capacity of the liquefaction trains of the Authorized Project, from 6,175 MTPA to 4.53 MTPA each.

- The inclusion of a third train for the remaining capacity (1,645 MTPA for each train, 3.29 MTPA total), maintaining the total capacity of the system (12.35 MTPA, taking three liquefaction trains into account).

- The reduction is achieved by modifying the operation of the starter/auxiliary motors (M1-3101/3102 and M2-3101/3102) for propane and MR refrigerant compression for each authorized train. This, as a result of the Modification, will only be operated for the relevant train operation startup, thus they will have less power.

- The EFG HI-1906 and H2-1906 heat exchangers, which liquefy last-expansion gas recirculated from the last-expansion gas compressor discharge, will be removed.

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- The area within the Regasification Plant (Non-cleared areas within the Regasification Plant), intended for workshops and storage, becomes the Pretreatment Area for liquefaction train 3; therefore, for the Modification, these areas are relocated to the Control Room and Maintenance Area.

- The Authorized Project area within the Regasification Plant intended for the BOG compressor system and the firefighting water system become the Liquefaction Area (liquefaction train 3).

- The Authorized Project's BOG compressor system is relocated to the Compressor Area for the Modification, and the firefighting water system is maintained within the Liquefaction Area for the Modification.

- The Control Room Area changes to the Control Room and Maintenance Area, and its surface is also increased.

- The Substation and Racks Area changes to the Racks Area.

- The Burners Area occupies the area of the Authorized Project intended for the plant nursery and the Racks Area; therefore, the surface in these areas is decreased.

- The Substation is relocated to within the Authorized Project Liquefaction Plant.

- The heavy-load road toward the Liquefaction Area connects to part of the Access road toward the meeting center, at TCF #2 and at the authorized Racks Area; therefore, the surface for these components changes.

- The use of Authorized Project areas as Temporary areas for the Modification, which will subsequently have permanent use included in the Authorized Project.

- A change in the Access road route toward the meeting center from the Authorized Project.

- The Liquefaction Plant surface (approx. 11.45 m^2) is reduced due to the removal of a corridor from the entrance booth.

- Equipment is added to some of the authorized Process Units and Services for the Authorized Project.

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- The installation of specific equipment within authorized Regasification Plant areas.

- Modification to the vegetation zone in the Polygonal Area of the Authorized Project due to fieldwork.

- A change in the surface location for Redensification and Natural Vegetation intended for the activity proposed in Mitigation Measure MV-02 of the Authorized Project within the same Polygonal Area, due to the installation of the burners (Burners Area), the Heavy-Load Road to the Pretreatment Area and occupying the non-cleared areas at the Regasification Plant for safety; therefore, the provisions in the Authorized Project remain unchanged and the additional area occupied by the Modification is incorporated.

V. The **REGULATED PARTY** stated that the requested modification it intends to carry out with respect to the **PROJECT**:

- DOES NOT change the liquefaction capacity of 12.35 MTPA considered in the Authorized Project;

- DOES NOT change the general specifications for the components of the Authorized Project;

- DOES NOT modify the construction method or the operating philosophy of the Authorized Project. However, the simultaneous regasification and liquefaction operation mode is added, taking into account only the operation of liquefaction train 3.

- DOES NOT change the Authorized Project location, which is located in the Municipality of Ensenada, in the state of Baja California.

- DOES NOT modify the 10-year development of the Authorized Project during the Site Preparation and Construction stages, since the general work program is redistributed with respect to the development of liquefaction train 3.

- DOES NOT change the Regional Environmental System (SAR, for its abbreviation in Spanish) and the Influence Areas in the Land Ecosystem and Marine Ecosystem, delimited for the Authorized Project, since the Modification is within them.

- The type and temporality of impacts identified and assessed for the Authorized Project remain in the Modification. However, for the Modification, only one new impact was identified in the Operation and Maintenance stage, related to the cooling system water discharge at Unit 31.

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- The environmental impacts identified and assessed for the Authorized Project and the Modification are distributed throughout the requested period for the Site Preparation and Construction stages.

- The Environmental Risk Analysis demonstrates that all High Risk Zones have an acceptable risk level.

- The only High Risk Zones that marginally cross the Polygonal Area boundary of the Authorized Project toward a lot that has natural vegetation correspond to Thermal Radiation from Fiery Darts from two subsystems. For this reason, a physical barrier (wall) is proposed as a measure for the facilities.

Likewise, the Modification, as well as the Authorized Project, justifies the integration of a liquefaction process into the existing infrastructure within La Jovita[1] Energy Center, with its zoning taken into account in the Regional Program for Urban, Tourism, and Ecological Development of the Tijuana, Rosarito, Ensenada (COCOTREN)[2] Coastal Corridor, based on the following:

Item	Description
Technical Justification	
Proven technology	• The technologies commonly used for the liquefaction process in large-scale projects are mainly those developed by Air Products and Chemicals (APCI) and Conoco Phillips Cascade Process. (WoodMackenzie, 2015)3 • The technology proposed for the Authorized Project and liquefaction train 3, the subject of this Modification, is the technology based on what APCI has developed, which is the same technology used in other similar projects in operation around the world and currently under construction by an affiliated company (Sempra LNG&M), at Cameron LNG, in Louisiana, USA. • This technology has been approved by regulatory authorities in Mexico and the USA, as well as successfully financed by international development banks. (Moody's, 2014) • With respect to processing the natural gas feed coming from the gas pipeline, both the Authorized Project and liquefaction train 3, subject of this Modification, include dedicated pretreatment equipment for each train, which is based on TechnipFMC's technical experience with similar units in operation and under construction in successful LNG projects.

1This zoning has infrastructure for receipt and delivery by sea, storage and transport of LNG and LPG, as well as electric power generation that benefits industrial, commercial, and residential customers. The energy reform promoted at the federal level anticipates positive impacts in Baja California: this region is strategically positioned for infrastructure projects that increase connectivity in the Corridor, between Baja California and Baja California Sur, and with the rest of Mexico and other regions.
[2] Published in the Official Newspaper of the Government of Baja California on December 26, 2014.
[3] WoodMackenzie. (November 2015). Outlook for the LNG EPC sector. Obtained from www.woodmac.com.

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Item	Description
Relation of Existing Facilities, Authorized Project, and Modification Project (train 3)	• In order to have technical consistency in the design and integration of the Existing Facilities and the Authorized Project, the engineering and design activities were performed with the engineering firm TechnipFMC. This is a firm recognized as one of the leading firms in the LNG storage, regasification and liquefaction industry, which carried out the engineering for the Authorized Project and has become familiar with and validated design and operation technical aspects in the Existing Facilities. • Just like the natural gas pretreatment and liquefaction equipment for the Authorized Project, liquefaction train 3 equipment will be fully compatible with the Existing Facilities. • The use of processes and services at the Existing Facilities anticipates a lesser Impact due to their excavation. • The arrangement and distribution of equipment that forms liquefaction train 3 is distributed within the Existing Facilities, maximizing the spaces and installed infrastructure and provided for in the Authorized Project. The minimum adaptations to incorporate this Modification are presented in this document. • The design of interconnections and incorporation of infrastructure, the subject matter of this Modification, have been prepared according to the operation of the Existing Facilities, which are not anticipated to have an interruption in service availability, since they will be scheduled during regularly scheduled maintenance, minimizing the risk.
Environmental Justification	
Reduction of emissions	• In turn, at a global level, the use of NG as a fuel for power generation is replacing less efficient, and therefore more polluting fuels such as fuel oil and coal. *(Secretariat of Energy, 2015)*[4].
Safe Facilities	• The Regasification Plant started operation in May of 2008, and during its 10 years of operation there has been no environmental accident that endangers biodiversity or the environmental integrity of the Regional Environmental System where it is located. • There is clear ECA determination and commitment to continuous improvement in environmental and safety management and the evidence is the different certifications for safety, health, and the environment that the Regasification Plant has, which are listed below: <u>Current national certifications:</u> - Environmental Quality Certificate Level 1 NC211216, since March 2014 - Self-management Program for Occupational Safety and Health - Level 2, since February 25, 2015 - Self-management Program for Safety and Health at Work - Level III, which was held in February 2016 <u>Accredited certifications obtained from international entities:</u> - ISO 14001-2004 Certificate 24701, since January 2015 - ISO 9001:2008 (2013) - OHSAS 18001:2007 (2015) • The design bases consider strict Compliance with all applicable national safety standards and, in the absence of these, international best industry practices for this type of infrastructure shall apply. • LNG processes (regasification), receipt and discharge operations are carried out in a safe manner, as evidenced by maintenance and operation verifications in compliance with Mexican Official Standard NOM-013-SECRE-2012, Safety Requirements for the Design, Construction, Operation and Maintenance of Liquefied Natural Gas (LNG) Storage Terminals that includes Systems, Equipment, and Facilities for Natural Gas Receipt, Conduction, Vaporization, and Delivery (NOM-013-SECRE-2012).
Preservation and environmental improvement	• The success of measures set forth in the Subprograms of the Environmental Quality Monitoring Program (PSCA, for its abbreviation in Spanish) for the Regasification Plant indicates states of preservation and conservation greater than similar ecosystems in the region, both marine and land, as proven in the Environmental Reports by PSCA.

[4]Secretariat of Energy. (2015). 2015-2029 Electricity Sector Foresight.

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Item	Description
	• In turn, the impacts identified in the MIA-R for the Authorized Project and liquefaction train 3, subject matter of this Modification, resulting from the Construction Stage will be prevented, mitigated, and/or compensated through the PSCA, as authorized and presented in this Modification. • The Project will maintain a commitment to safety, health, and environmental certifications.
Economic Justification	
Strategic Investments	• The Project generates direct and strategic investment in Mexico and projects the region as one of the ideal sites to install an infrastructure of this scope to supply the market, mainly in Asia-Pacific during Phase 1 of the Project, when liquefaction train 3, subject matter of this Modification, meets the demand. In Phase 2, when liquefaction trains 1 and 2 of the Authorized Project will supply the market in Asia, South America, and Europe. • ECA estimates that the aggregate investment of the Authorized Project and liquefaction train 3, subject matter of this Modification, will add a range of 5,000 to 6,000 additional jobs during the Site Preparation and Construction Phase of the Original Project to the already existing jobs; for the Liquefaction Operation, 220 employees are needed, including those required to operate the Regasification Plant, as well as important investments in materials and equipment from the region. This increase in the number of employees to operate the Project will be based on the needs in each phase identified in the Schedule.
Regional Economic Impact	• A percentage of the Project's total capital investment will directly affect the state of Baja California and the rest of the Mexican Republic (*Colegio de la Frontera Norte, 2016*). • It is estimated that, during the construction period, the portion that impacts Baja California and the rest of Mexico will have direct, indirect, and induced effects on both internal production and employment generation (*Colegio de la Frontera Norte, 2016*). • During the Construction Phase, it is estimated that the Project would generate multiples of economic impact of approximately 1.28 times the direct investment in the region of Baja California, and 1.59 times the direct investment in the rest of the Mexican Republic; likewise, it is expected that direct, indirect, and induced jobs will be generated in Baja California and the rest of Mexico during the Construction Phase by a multiple of ~2.5 times the number of workers required on site on average per year (*Colegio de la Frontera Norte, 2016*). • During the Operation Phase, it is estimated that the Project would generate very similar multiples of employment for approximately 220 employees: Approximately 70 employees for offices and 150 employees on site and internal production (added value) to those introduced during the Construction Phase, both for Baja California and the rest of the Mexican Republic (*Colegio de la Frontera Norte, 2016*).

Based on the foregoing, the **REGULATED PARTY** stated that the Modification does not imply an assessment framework different from the one presented in the **MIA-R** for the Authorized Project

VI. The **REGULATED PARTY** submitted a breakdown of permanent and temporary surfaces according to the following tables:

Comparison of the Liquefaction Plant Coordinates

Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V1	511,545.26	3,539,477.04	44.78 ha

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V1	514,545.26	3,539,477.04	44.78 ha

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Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Liquefaction Plant (includes liquefaction trains, burners, and slope areas)	V2	514,557.53	3,539,447.36	(447,818,694.5 m^2)
	V3	514,979.52	3,539,134.98	
	V4	515,033.94	3,539,018.29	
	V5	515,185.45	3,538,906.46	
	V6	515,212.30	3,533,863.84	
	V7	515,604.36	3,538,588.47	-
	VS	515,629.20	3,538,687.81	
	V9	515,867.14	3,538,783.33	
	V10	515,862.39	3,538,837.11	
	V11	515,811.52	3,538,891.52	
	V12	515,724.77	3,538,895.40	
	V13	515,630.33	3,538,920.89	
	V14	515,535.11	3,539,007.06	
	V15	515,418.68	3,539,148.47	
	V16	515,380.66	3,539,222.38	
	V17	515,380.93	3,539,251.87	
	V18	515,289.85	3,539,301.22	
	V19	515,100.46	3,539,436.67	
	V20	515,050.12	3,539,453.89	
	V21	514,968.13	3,539,512.42	
	V22	514,931.90	3,539,512.20	
	V23	514,750.84	3,539,651.77	
	V24	514,724.46	3,539,655.42	
	V25	514,719.85	3,539,660.93	
	V26	514,692.39	3,539,641.13	
	V27	514,691.87	3,539,641.51	
	V28	514,688.50	3,539,640.04	
	V29	514,634.87	3,539,642.71	-
	V30	514,634.04	3,539,641.57	
	V31	514,688.48	3,539,638.30	
	V32	514,551.97	3,539,539.83	
	V33	514,550.27	3,539,534.88	
	V34	514,548.17	3,539,523.62	

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Liquefaction Plant (includes liquefaction trains, burners, and slope areas)	V2	514,557.53	3,539,447.36	(447,807,245.9 m^2)
	V3	514,979.52	3,539,134.98	
	V4	515,033.94	3,539,018.29	
	V5	515,185.45	3,538,906.46	
	V6	515,212.30	3,538,863.84	
	V7	515,604.36	3,538,588.47	
	V8	515,629.20	3,538,687.81	
	V9	515,867.14	3,538,783.33	
	V10	515,862.39	3,538,837.11	
	V11	515,811.52	3,538,891.52	
	V12	515,724.77	3,538,895.40	
	V13	515,630.33	3,538,920.89	
	V14	515,535.11	3,539,007.06	
	V15	515,418,68	3,539,148.47	
	V16	515,380.66	3,539,222.38	
	V17	515,380.93	3,539,251.87	
	V18	515,289.85	3,539,301.22	
	V19	515,100.46	3,539,436.67	
	V20	515,050.12	3,539,453.89	
	V21	514,968.13	3,539,512.42	
	V22	514,931.90	3,539,512.20	
	V23	514,750.84	3,539,651.77	
	V24	514,724.46	3,539,655.42	
	V25	514,719.85	3,539,660.93	
	V26	514,692.39	3,539,641.13	
	V27	514,688.48	3,539,638.30	
	V28	514,551.97	3,539,539.83	
	V29	514,550.27	3,539,534.88	
	V30	514,548.17	3,539,523.62	

Difference	11.45	m^2

Comparison of the Coordinates for the Control Room and Maintenance Areas

Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Control Room Area	V1	514,471.89	3,539,545.57	1.01 ha (101,054,547 m^2)
	V2	514,537.89	3,539,533.92	
	V3	514,536.24	3,539,525.11	
	V4	514,534.84	3,539,502.82	
	V5	514,528.00	3,539,393.21	
	V6	514,487.95	3,539,392.96	

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Control Room and Maintenance Area	V1	514,517.64	3,539,533.43	1.07 ha (106,621,668 m^2)
	V2	514,474.72	3,539,535.35	
	V3	514,471.11	3,539,534.66	
	V4	514,467.26	3,539,503.32	
	V5	514,463.49	3,539,496.50	
	V6	514,458.18	3,539,417.11	

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Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V7	514,476.62	3,539,393.88	
	V8	514,467.88	3,539,398.10	
	V9	514,460.31	3,539,407.48	
	V10	514,458.18	3,539,417.11	
	V11	514,463.49	3,539,496.50	
	V12	514,467.26	3,539,503.32	
	V13	514,471.72	3,539,539.61	

Difference	556.71	m^2

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V7	514,460.31	3,539,407.48	
	V8	514,457.88	3,539,398.10	
	V9	514,476.62	3,539,393.88	
	V10	514,487.95	3,539,392.96	
	V11	514,502.28	3,539,393.05	
	V12	514,514.70	3,539,393.12	
	V13	514,528.00	3,539,393.21	
	V14	514,535.07	3,539,395.14	
	V15	514,538.89	3,539,398.53	
	V16	514,542.08	3,539,401.83	
	V17	514,545.14	3,539,405.70	
	V18	514,548.47	3,539,411.17	
	V19	514,551.35	3,539,417.26	
	V20	514,553.19	3,539,422.41	
	V21	514,554.24	3,539,427.07	
	V22	514,554.68	3,539,429.72	
	V23	514,555.12	3,539,434.00	
	V24	514,555.18	3,539,440.85	
	V25	514,554.94	3,539,442.31	
	V26	514,554.63	3,539,444.71	
	V27	514,554.21	3,539,446.62	
	V28	514,553.07	3,539,450.04	
	V29	514,549.54	3,539,458.95	
	V30	514,541.56	3,539,471.47	
	V31	514,539.28	3,539,474.65	
	V32	514,539.28	3,539,474.65	
	V33	514,531.54	3,539,488.25	
	V34	514,528.67	3,539,492.98	
	V35	514,524.67	3,539,501.06	
	V36	514,523.83	3,539,502.91	
	V37	514,520.76	3,539,512.50	
	V38	514,519.00	3,539,520.52	

Comparison of Racks Area Coordinates

Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Substation and Racks Area	V1	514,549.55	3,539,393.75	4.31 ha (430,601,842 m^2)
	V2	514,540.03	3,539,393.38	
	V3	514,545.26	3,539,477.04	
	V4	514,557.53	3,539,447.36	
	V5	514,979.52	3,539,134.98	
	V6	515,000.25	3,539,090.53	
	V7	514,953.42	3,539,063.96	
	V8	514,891.11	3,539,033.71	
	V9	514,847.31	3,539,008.09	
	V10	514,825.67	3,539,035.05	
	V11	514,334.58	3,539,049.20	
	V12	514,843.27	3,539,079.51	
	V13	514,343.96	3,539,089.71	
	V14	514,842.04	3,539,114.13	
	V15	514,838.48	3,539,128.22	
	V16	514,828.92	3,539,143.91	
	V17	514,820.41	3,539,155.17	

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Racks Area	V1	514,581.28	3,539,379,25	3.40 ha (340,062,443 m^2)
	V2	514,582.63	3,539,379.11	
	V3	514,582.41	3,539,380.53	
	V4	514,574.40	3,539,393.72	
	V5	514,572.15	3,539,398 52	
	V6	514,571.51	3,539,401.91	
	V7	514,569.99	3,539,409.90	
	V8	514,570.43	3,539,415.20	
	Curvature	0.08		
	Center	514,505.70	3,539,427.31	
	Radius	65.94		
	Initial angle	349		
	Final angle	8		
	V9	514,570.94	3,539,437.43	
	V10	514,979.52	3,539,134.98	
	V11	515,000.25	3,539,090.53	
	V12	514,962.93	3,539,069.35	

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Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V18	514,734.86	3,539,235.67	
	V19	514,616.54	3,539,344.03	
	V20	514,580.61	3,539,379.91	
	V21	514,571.40	3,539,386.94	
	V22	514,563.24	3,539,390.72	
	V23	514,555.45	3,539,393.29	

Difference	9,053.94	m^2

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V13	514,961.36	3,539,070 67	
	V14	514,952.74	3,539,077.92	
	V15	514,946.10	3,539,083.50	
	V16	514,928.98	3,539,092.09	
	V17	514,918.91	3,539,097.14	
	V18	514,914.16	3,539,099.52	
	V19	514,904.09	3,539,104.57	
	V20	514,894.03	3,539,109.61	
	V21	514,889.00	3,539,112.13	
	V22	514,884.86	3,539,115.95	
	V23	514,880.49	3,539,119.97	
	V24	514,879.99	3,539,122.84	
	V25	514,879.11	3,539,127.83	
	V26	514,878.20	3,539,133 02	
	V27	514,871.09	3,539,128.08	
	V28	514,868.53	3,539,126.71	
	V29	514,865.48	3,539,125.55	
	V30	514,866.36	3,539,120.18	
	V31	514,866.68	3,539,113.21	
	V32	514,866.05	3,539,106.98	
	V33	514,865.48	3,539,104.20	
	V34	514,864.01	3,539,098.50	
	V35	514,856.54	3,539,080.03	
	V36	514,851.21	3,539,069.40	
	V37	514,846.04	3,539,059.30	
	V38	514,833.72	3,539,042.81	
	V39	514,827.70	3,539,037.17	
	V40	514,825.68	3,539,035.06	
	V41	514,334.58	3,539,049.20	
	V42	514,843.27	3,539,079.51	
	V43	514,843.96	3,539,089.71	
	V44	514,842.04	3,539,114.13	
	V45	514,838.48	3,539,128.22	
	V46	514,823.92	3,539,143.91	
	V47	514,820.41	3,539,155.17	
	V48	514,734.86	3,539,235.67	
	V49	514,616.54	3,539,344.03	

Plant Nursery Coordinates Comparison

Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Plant nursery	V1	514,846.43	3,538,937.41	2.91 ha (290,799,157 m^2)
	V2	514,816.78	3,538,962.44	
	V3	514,817.43	3,538,973.46	
	V4	514,847.03	3,538,993.32	
	V5	514,953.17	3,539,049.43	
	V6	515,017.39	3,538,989.24	
	V7	515,057.19	3,538,958.72	
	V8	515,124.15	3,538,904.79	
	V9	515,215.76	3,538,826.67	
	V10	515,303.39	3,538,748.34	
	V11	515,359.11	3,538,718.81	
	V12	515,295.47	3,538,650.46	
	V13	515,270.46	3,538,689.28	

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
Plant nursery	V1	515,005.24	3,539,000.63	1.87 ha (187,234,939 m^2)
	V2	515,017.39	3,538,989.24	
	V3	515,057.19	3,538,958.72	
	V4	515,124.15	3,538,904.79	
	V5	515,215.76	3,538,826.67	
	V6	515,303.39	3,538,748.34	
	V7	515,359.11	3,538,718.81	
	V8	515,295.47	3,538,650.46	
	V9	515,270.46	3,538,689.28	
	V10	515,258.55	3,538,715.01	
	V11	515,205.37	3,538,775.32	
	V12	515,195.64	3,538,783.06	
	V13	515,174.16	3,538,800.33	

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Authorized Project				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V14	515,258.55	3,538,715.01	
	V15	515,205.37	3,538,775.32	
	V16	515,195.64	3,538,783.06	
	V17	515,174.16	3,538,300.33	
	V18	515,166.55	3,538,824.55	
	V19	515,146.09	3,538,832.43	
	V20	515,121.53	3,538,862.73	
	V21	515,082.62	3,538,888.92	
	V22	515,076.40	3,538,907.23	
	V23	515,054.95	3,538,929.54	
	V24	515,042.26	3,538,955.86	
	V25	515,020.12	3,538,966.68	
	V26	515,005.56	3,538,981.01	
	V27	514,990.41	3,538,989.53	
	V28	514,962.17	3,538,986.66	
	V29	514,933.15	3,538,977.66	
	V30	514,893.07	3,538,935.84	
	V31	514,869.54	3,538,925.53	
	V32	514,846.43	3,538,937.41	

Difference	10,356.42	m^2

Modification				
Component	Vertex	Coordinates		Surface (ha)
		X	Y	
	V14	515,166.55	3,538,824.55	
	V15	515,146.09	3,538,832.43	
	V16	515,121.53	3,538,862.73	
	V17	515,082.62	3,538,388.92	
	V18	515,076.40	3,538,907.23	
	V19	515,054.95	3,533,929.54	
	V20	515,042.26	3,538.955.86	
	V21	515,020.12	3,538,966.68	
	V22	515,005.56	3,538,981.01	
	V23	514,990.41	3,538,989.53	
	V24	514,962.17	3,533,986.66	
	V25	514,933.15	3,538,977.66	
	V26	514,893.07	3,533,935.84	
	V27	514,890.63	3,533,934.79	
	V28	514,893.97	3,538,938.22	
	V29	514,901.76	3,538,946.35	
	V30	514,905.43	3,538,950.18	
	V31	514,913.22	3,538,958.31	
	V32	514,921.02	3,538,966.45	
	V33	514,924.69	3,538,970.28	
	V34	514,932.46	3,538,978.49	
	V35	514,943.19	3,538,981.82	
	V36	514,948.27	3,538,983.40	
	V37	514,961.95	3,538,987.64	
	V38	514,970.11	3,538,983.44	
	V39	514,975.40	3,538,988.95	
	V40	514,986.60	3,538,990.04	
	V41	514,996.54	3,538,991.00	
	V42	514,998.86	3,538,993.57	
	V43	515,001.16	3,538,996.11	

Comparison of Coordinates for the Meeting Center Access Road

Authorized Project						
Roads	Initial Coordinates		Final Coordinates		Length (m)	Approx. width (m)
	X	Y	X	Y		
Meeting center access road	514,522.64	3,539,573.77	515,338.49	3,538,746.41	1,187.33	4.5

Modification						
Roads	Initial Coordinates		Final Coordinates		Length (m)	Approx. width (m)
	X	Y	X	Y		
Meeting center access road	514,571.39	3,539,434.29	515,338.98	3,538,748.46	1,033.53	4.5

Difference	153.80	m

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VII. The **REGULATED PARTY** submitted a comparative analysis by surface area, where it describes that the Polygonal Area of the Authorized Project occupies a total surface of 332.99 ha of the land part and includes the area where the Regasification Plant is currently operating; this surface does not undergo changes due to the Modification. The Authorized Project provided 81.42 ha for the permanent areas; 69.94 ha for the Land Ecosystem, and 11.48 ha for the Marine Ecosystem; the Marine Ecosystem does not undergo changes with the Modification, while the Land Ecosystem changes to 71.02 ha; this is why the total surface changes to 82.50 ha for the permanent areas. In the Authorized Project, 45.48 ha of temporary surface were required for the Land Ecosystem; thus, that surface changes to 45.55 ha with the Modification.

Similarly, the **REGULATED PARTY** submitted tables that show the breakdown of permanent and temporary surfaces, highlighting the surface components that changed:

Permanent Surfaces in the Land Ecosystem

Authorized Project				
Component		**Surface Area of Permanent Facilities (ha)**	**Surface Area of Permanent Slopes (ha)**	**Total Permanent Surface Area (ha)**
Liquefaction Plant	Liquefaction Trains	2183	15.21	44.78
	Burners	7.74		
Heavy-Load Transportation Road		5.17	5.92	11.08
Parking Area (1)		0.47	-	0.47
Control Room Area		1.01	-	1.01
Substation and Racks Area		4.31	-	4.31
Meeting center access road (2)		0.27	-	0.27
Road No. 2, Staff Emergency Exit (3)		0.01	-	0.01
Primary roads for the Plant (4)		0.02		0.02
Plant Nursery		2.91	-	2.91
Racks (5)		0.01	-	0.01
MOF Material Area		2.85	1.15	3.99
MOF (Land Ecosystem)		1.08	-	1.08
Total (ha)		**47.67**	**22.27**	**69.94**

Authorized Project and Modification				
Component		**Surface Area of Permanent Facilities (ha)**	**Surface Area of Permanent Slopes (ha)**	**Total Permanent Surface Area (ha)**
Liquefaction Plant	Liquefaction Trains	21.83	15.21	44.78
	Burners	7.74		
Heavy-Load Transportation Road		5.17	5.92	11.08
Parking Area (1)		0.47	-	0.47
Control Room and Maintenance Area		1.07	-	1.07
Racks Area		140	-	3.40
Meeting center access road (2)		0.23	-	0.23
Road No. 2, Staff Emergency Exit (3)		0.01	-	0.01
Primary roads for the Plant (4)		0.02	-	0.02
Plant Nursery		1.87	-	1.87
Racks (5)		0.01	-	0.01
MOF Material Area		2.85	1.15	3.99
MOF (Land Ecosystem)		1.08		1.08
Heavy-Load Road to the Liquefaction Area (7)		0.32	-	0.32
Burners area for liquefaction train 3 (8)		2.68	-	2.68
Total (ha)		**48.75**	**22.27**	**71.02**
Difference in surface area between the Authorized Project and Modification Development (ha)		**1.08**		

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Authorized Project			
Component	Surface Area of Permanent Facilities (ha)	Surface Area of Permanent Slopes (ha)	Total Permanent Surface Area (ha)

(1) The total parking surface area is 0.61 ha; however, 0.14 ha are located above the authorized area (access road Modification). Therefore, only the remaining 0.4 7 ha are considered.
(2) The Meeting center access road occupies a total surface of 0.54 ha; however, 0.27 ha are located over the area for the control room and the area for the substation and Racks, thus only 0.27 ha are considered.
(3). (4) Road No. 2, personnel emergency exit, has a total surface area of 0.08 ha; however, 0.07 ha are on the surface already considered for the Liquefaction Plant; thus only 0.01 ha is considered.
(4) The primary roads are located within the Liquefaction Plant, with their surface area already considered; however, 0.02 ha are needed for access.
(5) The Racks occupy a total area of 1.76 ha; however, 1.75 ha are located over the area already considered the Liquefaction Plant, Regasification Plant, control room area, and the area for the substation and Racks.
- The control room access road (019 ha) and Road No. 1, personnel emergency exit (0.05 ha), are located within the surface area already taken into account for the Liquefaction Plant, the substation and Racks area, as well as the Regasification Plant, therefore no surfaces are accounted for.

Authorized Project and Modification			
Component	Surface Area of Permanent Facilities (ha)	Surface Area of Permanent Slopes (ha)	Total Permanent Surface Area (ha)

(1) The total parking surface area is 0.61 ha; however, 0.14 ha are located above the authorized area (access road Modification). Therefore, only the remaining 0.4 7 ha are considered.
(2) The Meeting center access road takes up a total surface of 0.48 ha; however, **0.25** ha are located above the Racks Area, thus only **0.23 ha** are considered.
(3). (4) Road No. 2, personnel emergency exit, has a total surface area of 0.08 ha; however, 0.07 ha are located on the surface already taken into account for the Liquefaction Plant, thus only 0.01 ha is considered.
(4) The primary roads are located within the Liquefaction Plant, with their surface area already considered; however, 0.02 ha are needed for access.
(5) The Racks occupy a total area of 1.76 ha; however, 1 75 ha are located on surfaces already taken into account for the Liquefaction Plant. Regasification Plant, Control Room and Maintenance Area and Racks Area.
(6) Control room access road (0.19 ha) and Road No. 1, personnel emergency exit (0.05 ha) are located within surfaces already considered for the Liquefaction Plant, the Racks area, as well as the Regasification Plant, thus no surfaces are considered.
(7) The Heavy-load Road to the Liquefaction Area has a total surface area of 0.38 ha; however, 0.06 ha have already been requested.
(8) The Burners Area for liquefaction train 3 has a total surface of 2.97 ha, however, 0.29 ha have already been requested.

Permanent Surfaces Areas in the Marine Ecosystem with no Changes

Authorized Project	
Component	Permanent surfaces (ha)
MOF in the Marine Ecosystem	0.56
Raised roadway and breakwater	4.04
Watercraft area	6.87
Total MOF Area in the Marine Ecosystem	**11.48**

Authorized Project and Modification	
Component	Permanent surfaces (ha)
MOF in the Marine Ecosystem	0.56
Raised roadway and breakwater	4.04
Watercraft area	6.87
Total MOF Area in the Marine Ecosystem	**11.48**

Temporary Surfaces

Authorized Project			
Component	Temporary Platform surfaces (ha)	Temporary Slopes surfaces (ha)	Total Temporary Surfaces (ha)
TCF#1	6.41	0.28	6.69
TCF#2	0.55		0.55
TCF#3	1.22	0.41	1.63
TCF#4	2.69	0.77	3.46
TCF#5	4.71	-	4.71
TCF#6	3.24	0.58	3.82

Authorized Project and Modification			
Component	Temporary Platform surfaces (ha)	Temporary Slopes surfaces (ha)	Total Temporary Surfaces (ha)
TCF#1	6.41	0.28	6.69
TCF#2	0.49		0.49
TCF#3	1.22	0.41	1.63
TCF#4	2.69	0.77	3.46
TCF#5	4.71	-	4.71
TCF#6	3.24	0.58	3.82

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Authorized Project			
Component	**Temporary Platform surfaces (ha)**	**Temporary Slopes surfaces (ha)**	**Total Temporary Surfaces (ha)**
TCF#7	6.41	0.28	6.69
TCF#8	0.55		0.55
TCF#9	1.22	0.41	1.63
Total	**39.44**	**6.04**	**45.48**

Authorized Project and Modification			
Component	**Temporary Platform surfaces (ha)**	**Temporary Slopes surfaces (ha)**	**Total Temporary Surfaces (ha)**
TCF#7	6.41	0.28	6.69
TCF#8	0.49		0.49
TCF#9	1.22	0.41	1.63
Heavy-Load Road to Pretreatment Area	0.13		0.13
Total	**39.52**	**6.04**	**45.55**

VIII. The **REGULATED PARTY** stated that the authorized Project, as well as the Modification, will need to occupy areas at the Regasification Plant, for which it has authorization for 27.8385 ha, within which there are polygons that have not been cleared. For the Modification development, specific equipment will be installed on authorized areas at the Regasification Plant. The following section shows the location of equipment required to develop liquefaction train 3. The surface area to be occupied by the Regasification Plant with vegetation is updated from 2.53 ha to 4.68 ha, as described in the following table:

Facilities within the Regasification Plant

Authorized Project				
Component	**Authorized surface area (ha)**	**Areas within the Regasification Plant**	**Liquefaction Facilities within the Regasification Plant**	**Approx. surface area to be occupied (ha)**
Regasification Plant	27.8385	Non-cleared areas within the Regasification Plant	Racks	2.53
			Part of the control room access road	
			LNG Tank Car Loading Station	
			Maintenance workshop	
			Warehouse	
			Manufacturing workshop	
			Laboratory	
			Break room	
			Hazardous chemical products storage	
		Within authorized areas	Electric power generation plant	-

Authorized Project and Modification				
Component	**Authorized surface area (ha)**	**Areas within the Regasification Plant**	**Modification Facilities within the Regasification Plant**	**Approx. area to be occupied (ha)**
Regasification Plant	27.8385	Non-dismantled areas within the Regasification Plant and Forest Vegetation within authorized areas (Process Area)	**Pretreatment Area**	4.68
			Heavy-Load Road to Pretreatment Area	
			Compressors Area	
			Areas cleared due to safety	
			Service Area	
			Temporary Area 2 (LNG Tank Car Loading Station)	
			Heavy-Load Road to Liquefaction Area	
			Pretreatment Area	
			Heavy-Load Road to Pretreatment Area	
			Compressors Area	

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Authorized Project				
Component	**Authorized Surface Area (ha)**	**Areas within the Regasification Plant**	**Liquefaction Facilities within the Regasification Plant**	**Approx. Surface Area to be Occupied (ha)**
			Sanitary waste treatment plant	
			BOG compressor system	
			Oil lubrication system	
			Firefighting diesel pumps	
			Tank #T0-2003	
			LNG Tank Car Loading Station	
			Racks	
			Total	**2.53**

Authorized Project and Modification				
Component	**Authorized Surface Area (ha)**	**Areas within the Regasification Plant**	**Modification Facilities within the Regasification Plant**	**Approx. Surface Area to be Occupied (ha)**
			Service Area	
			Temporary Area 2 (LNG Tank Cars Loading Station)	
			Burners Area	
		Within authorized areas	Electric power generation plant	
			Sanitary waste treatment plant	
			Oil lubrication system	
			Firefighting diesel pumps	
			Tank #T0-2003	
			LNG Tank Car Loading Station	
			Racks	
			Compressors Area	
			Liquefaction Area	
			Specific equipment for Liquefaction Train 3	
			Total	**-1.68**

Based on the above, the total surface requested in the Authorized Project of 129.43 ha is updated to 132.73 ha

Authorized Project	
Item	**Surface (ha)**
Permanent Land Ecosystem Surface	69.94
Permanent Marine Ecosystem Surface	11.48
Temporary surface	45.48
Permanent surface to be occupied within non-dismantled areas and authorized for the Regasification Plant	2.53
Total Project Surface (ha)	**129.43**

Authorized Project and Modification	
Item	**Surface (ha)**
Permanent Land Ecosystem Surface	71.02
Permanent Marine Ecosystem Surface	11.48
Temporary surface	45.55
Permanent surface to be occupied within non-dismantled areas and authorized for the Regasification Plant	4.68
Total Project Surface (ha)	**132.73**

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IX. The **REGULATED PARTY** described that, in order to determine the land use and current vegetation type in the Polygonal Area of the 332.99 ha of the Authorized Project, fieldwork was carried out and through an analysis assisted by the Google Earth Pro 2015 platform, current surfaces were estimated according to the following classification:

- Restoration areas: areas adjacent to the Regasification Plant's access road that were temporarily affected during the construction of the plant and where work was carried out to restore the existing vegetation.
- Existing roads: existing roads inside the Polygonal Area of the Project prior to the construction of any infrastructure.
- Construction: areas with construction or authorization to carry out constructions, not all of them promoted by ECA. The following are included under this line item:

    - ECA's Plant Nursery
    - the Meeting Center (Casa Azul)[5]
    - Lot 20[6] Warehouses
    - Permanent DDV of the Rosarito Gas Pipeline[7]
    - La Jovita[8] Branch
    - Communication Antenna
    - La Jovita Transmission Line tower foundations, the DDV is presented only graphically, since only clearing for the foundations was done.[9]
    - Booths

- Process Area: existing areas that have authorization to carry out LNG regasification; these areas are:

- Regasification Plant
- Regasification Plant's Access road
- Modification to the Regasification Plant's Access road

[5] The authorized project "Construction and Operation of the Casa Azul Break Room. Costa Azul. Municipality of Ensenada. B.C." by means of Official Document No. DFBC/SGPA/UGA/DIRA/4100/06, dated November 16, 2006, promoted by ECA.
[6] Authorized project "Camp and Support Facilities at Rancho San Nicolás Premises, Costa Azul, Municipality of Ensenada. B.C." by means of Professional Resolution Document DFBC-SGPA-D1-00952/05, dated April 18, 2005, promoted by Amaya Curiel y Compañía. S.A. de C.V. with change of ownership to Energía Costa Azul, S. de R.L. de C.V. through official document DFBC/SGPA/UGA/DGIRA/734/12.
[7] Authorized project "Construction and Operation of the Expansion of the Bajanorte Gas Pipeline" by means of Official Resolution Document 5.G.P.A./DGIRA/DE1.0675.04, dated May 18, 2004, promoted by Gasoducto Bajanorte, S. de R.L., de C.V.
[8] Authorized modification "Construction and Operation of the Expansion of the Rosarito Gas Pipeline - Tijuana to Ensenada Frontage Road - La Jovita Branch" by means of official document ASEA/UGA/DGGTA/0065/2015, dated October 23, 2015, promoted by Gasoducto Rosarito, S. de R.L. de C.V.
[9] Authorized project "36 CC Baja California III (Site: La Jovita), Modality; External Energy Producer (PEE, for its abbreviation in Spanish)" by means of Official Document No. S.G.P.A./DGIRA.DG.1561.11, dated March 16, 2011, promoted by the Federal Electricity Commission (CFE, for its abbreviation in Spanish).

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- Constraint 18 unvegetated areas: in compliance with Constraint 18 applied by the authorized Regasification Plant, which states: *Design the necessary engineering works for rainwater runoff to be deposited into appropriate sites within the terminal*; slopes were created on the Access road and a ditch was built, which is why these areas have no vegetation.
- Modification - Land Facilities, Areas with No Vegetation: this indicates the surface area of facilities that are on land taken from the sea.
- Areas with No Vegetation: those areas that lack of vegetation are located in Lot 20 and to the North of the Project Polygonal Area.
- No Vegetation Areas that have a Double Fence: these are the areas that correspond to the Regasification Plant's double protection fence.
- Areas with Natural Vegetation within the Regasification Plant: this indicates areas that were not cleared at the existing Regasification Plant.
- Areas with Natural Vegetation: areas with natural vegetation consisting of Rosette-like Coastal Scrub within the Project Polygonal Area.

The **REGULATED PARTY** described the surfaces according to the following table.

Land Use and Current Vegetation within the Authorized Project Polygonal Area.

Land Use and Vegetation	Surface (ha)
Restoration areas	2.60
Existing roads	7.75
Construction	7.04
Process Area	21.94
With no vegetation from Constraint 18	1.32
Modification - Land Facilities, No vegetation	3.07
No vegetation	2.69
No vegetation, double fence	0.84
Vegetation within the Regasification Plant	**6.13**
Natural Vegetation	279.62
Total	**332.99**

However, according to the fieldwork for the flora study for the modification, out of the 6.13 ha of vegetation identified within the Authorized Project of the Regasification Plant, only 3.57 ha are forest; thus 2.56 ha correspond to an UNFORESTED area. Likewise, within the surface area identified as a Process Area, there was forest vegetation that corresponded to 0.37 ha.

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X. The **REGULATED PARTY** described that train 3's liquefaction process has the following characteristics:

- It will be supplied in the same way as authorized, with Natural Gas coming from the Rosarito Gas Pipeline.

- The expected operating conditions (pressure and temperature) of the Natural Gas supply through the gas pipeline are:

Expected operating pressure:	6,900 kPag (69 barg)
Expected operating temperature:	16°C

- Temperature and pressure ranges of NG to be supplied through the gas pipeline to the LNG Plant at the battery limits will be as follows:

Minimum supply pressure:	5,500 kPag (55 barg)
Supply temperature range:	10 to 50°C
Maximum permissible operating pressure (MPOP) for the gas pipeline:	10,200 kPag (102 barg)

XI. The **REGULATED PARTY** described that liquefaction train 3 of the Modification will engage Process Units and Services, which were already authorized in the Authorized Project; however, new equipment will be incorporated into those Units, some of which will not undergo any changes for the Modification development.

The Modification will use the existing facilities at the Regasification Plant. Existing facilities will be modified as needed, in order to allow the addition of the liquefaction process for shipping LNG in tankers. Current capacity to receive and regasify LNG will remain unchanged. Special attention shall be paid to ensure the modifications made do not hinder the existing regasification and shipping facility operation.

The main equipment for the Modification consists of a new liquefaction train, common services, and support facilities. The equipment associated with liquefaction train 3 is within the Regasification Plant. In this same context, the **REGULATED PARTY** described on Page 111-34 to Page 111-58 of the Modification, the authorized individual units required for the liquefaction operation.

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XII. The **REGULATED PARTY** submitted an update to the general work schedule, which has not been modified; only the activities have been redistributed. Likewise, the **REGULATED PARTY** stated that at the time of this Modification, the works for the Authorized Project have not been developed, including liquefaction trains 1 and 2. The work for liquefaction train 3 will be carried out in Phase 1 and subsequently, in Phase 2, trains 1 and 2 will be developed.

XIII. The **REGULATED PARTY** submitted a summary of the Land Ecosystem-SAR characterization,

SAR Land Ecosystem and Modification

Authorized Project	Modification
SAR Land Ecosystem (ET-SAR, for its abbreviation in Spanish)	
Geopolitical Location	
The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project are located in the state of Baja California, in the municipality of Ensenada.	The state and municipal location of the ET-SAR, AI-T, the Authorized Project Polygonal Area, and the Authorized Project where the Modification will be carried out remain unchanged. The Modification is located within the: ET-SAR, the AI-T, and the Authorized Project Polygonal Area.
Abiotic Aspects	
Climate	
In the ET-SAR, the AI-T, the Authorized Project Polygonal Area and the Authorized Project area, there is only the BSks climate type (Köeppen classification, modified by E. García) which corresponds to a temperate arid climate, with an annual average temperature between 12°C and 18°C, with the temperature of the coldest month being between -3°C and 18°C, and the temperature of the hottest month being less than 22'C. It rains in the winter with a percentage greater than 36% the annual total.	The climate type in the ET-SAR, AI-T, the Authorized Project Polygonal Area, and the Authorized Project area where the Modification will be carried out remains unchanged. For the Modification, the climate type is 8Sks (Köeppen classification, modified by E. García), which corresponds to a temperate arid climate, with an annual average temperature between 12°C and 18°C, and the temperature of the coldest month being between -3°C and 18°C, and the temperature of the hottest month being less than 22°C. It rains in the winter with a percentage greater than 36% the annual total.
Normal Climactic Conditions, Climograph, and Wind	
Based on the variables of Normal climatology, climograph, and wind force and direction, it was concluded that the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area are in a single climate type that is arid temperate. For climatological stations 2077, 2005 and 2122, there are temperature records that describe a bell curve with maximums in July-September and the lowest in December-March; temperature is the climate variable that determines the climograph in the region as an arid temperate climate. Average annual rainfall for the climate surrounding the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area is 24.10 mm. There is stability in wind direction for each month within the ET-SAR, AI-T, the Authorized Project Polygonal Area, and the Authorized Project area, and this is maintained throughout the year.	The characteristics of Normal climatology, climograph, and wind at the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project where the Modification will be carried out are supported. Regarding the Modification, Normal climatology, climograph, and wind force and direction, it was concluded that these are in a single climate type which has an arid temperate. The climograph resulting from the information on climatological stations 2077, 2005 and 2122 describes a bell curve with the maximums in July-September and the minimums in December-March; with the temperature being the climate variable that determines the climograph in the region (typical of an arid temperate climate). Average annual rainfall for an ambient climate is 24.10 mm.

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Authorized Project	Modification
Wind direction in January-February is N-NE, in March-May it is NW-N, and in June-December it is W-NW.	There is stability in wind direction for each month and this is maintained throughout the year. Wind direction in January-February is N-NE, in March-May it is NW-N, and in June-December it is W-NW.
Extreme Climate Phenomena	
Climate variables measured at CONAGUA stations for the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project do not show any variation in the measured parameters that does not correspond to the BSks climate type (Arid, temperate). The only climate phenomena that have crossed within a 100-km radius (with a central point in the Authorized Project), and covering the entirety of the ET-SAR, have been Tropical Depressions Jen-Kath (1963), Emily (1965), and Kathlee (1976) (with data from year 1842 to August 2016); none of their paths passed over the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area.	The conditions that originate, weaken, and extinguish extreme climate phenomena in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project where the Modification will be carried out are maintained. The only climate phenomena that have crossed within a 100-km radius (with a central point in the Authorized Project), covering the entirety of the Modification, have been Tropical Depressions Jen-Kath (1963), Emily (1965) and Kathlee (1976) (with data from year 1842 to July 2018); none of their paths passed over the Modification.
Air Quality	
The station that measures air quality (operated by the National Institute of Ecology and Climate Change) closest to the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project is the Ensenada station (latitude 32°34'7.77" and longitude 116°37'36.77") and it only records ozone. Since it is at an approximate distance (in a straight line) of 22 km, its reports are not used, mainly, due to the distance and predominant annual wind field already described above, which prevents Ozone dispersion toward the area under evaluation. Within the ET-SAR, there are fixed and mobile sources of emissions into the atmosphere; fixed sources are, among others, Project 36 CC Baja California III (La Jovita Site) of Iberdrola, in its Operation and Maintenance and Z Gas stage. Within the AI-T, there are sources of emissions into the atmosphere coming from machinery and equipment at the Regasification Plant, owned by ECA, which use with Natural Gas to operate. The Regasification Plant integrates, in the Annual Operation Certificate (COA, for its abbreviation in Spanish) and the Environmental Quality Monitoring Program - Annual Report -, the results of their emissions into the atmosphere, and both are submitted to and assessed by SEMARNAT, as part of compliance with its normal operation and the constraints imposed on the ECA's MIA-R that gave origin thereto. None of the parameters reported by the Regasification Plant exceed the maximum permissible limits of the applicable health standards. Regarding ECA's LNG, the Site Preparation and Construction stage has not yet started; therefore, it does not constitute a source of emissions into the atmosphere.	The location of the National Institute of Ecology and Climate Change's weather station remains unchanged, and since it is located at an approximate distance of 22 km (in a straight line), its reports are not used for the characterization of the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area where the Modification will be carried out. Fixed sources of emissions into the atmosphere operating in the ET-SAR and AI-T of the Authorized Project area remain unchanged. Within the Modification, there are no fixed or mobile sources of emissions into the atmosphere. The modelling carried out for the Modification indicates that expected concentrations for each of the assessed parameters (and that are the same as those of the Authorized Project) do not exceed the regulated Maximum Permissible Limits (Appendix III.3) and are self-contained inside the Authorized Project Polygonal Area. With respect to the Study on Emissions into the atmosphere contained in Appendix 1.3, it is necessary to clarify that the modelling includes both emitting equipment for the Authorized Project and that of the Modification and the modelling corresponding to the latter determined that they remain self-contained within the Authorized Project Polygonal Area. For this reason, the AI-T for the Authorized Project remains unchanged and applies to the Modification.
Fixed Sources of Noise Emission and Perimeter Noise	

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Authorized Project	Modification
Within the ET-SAR and the AI-T, there are fixed sources of noise emission. Regarding the Regasification Plant, the perimeter noise studies proved that it does not exceed the maximum permissible levels established in the Regulations in force on the date of each study and as of 2013, with the modification published in the DOF on December 3, 2013, with its maximum permissible limits for an Industrial Zone of 68 dBA (daytime) and 65 dBA (night time). Regarding ECA's LNG, the Site Preparation and Construction stage has not yet started; therefore, it does not constitute a fixed source of noise emission. The 36 CC Baja California III (La Jovita Site) Project of Iberdrola, in its Operation and Maintenance and Z Gas stage, is also a source of noise emission and perimeter noise.	Fixed sources of noise emission and perimeter noise operating in the ET-SAR and the AI-T where the Modification will be carried out will remain unchanged. Within the Modification, there are no fixed sources of noise emission and perimeter noise.
Physiography and Geomorphology	
The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project are located in the physiographic province "Baja California Peninsula", in the sub-province "Mountain Ranges of Northern Baja California". The geomorphology of the ET-SAR, AI-T, the Authorized Project Polygonal Area, and the Authorized Project is characterized by having a massive granite nucleus of volcanic origin with a predominance of intermediate extrusive igneous rock. Its formation originated in the marine terraces' coastal zones and the emergent ones with the presence of cliffs. The AI-T is located on a surface layer of residual soil that is on top of volcanic rock, which is relatively thin (less than 1 m thick) formed by sands and gravel. Cliffs are sequenced in layers of extrusive volcanic rocks, including basalts and andesites. Volcanic rocks show alternating flow units with breccia agglomerates and boulders (volcanic derivation conglomerate) that can be more than 60 meters with basalt and andesite; the volcanic sequence sinks between 5 and 10 degrees to the east. Cliff exposures have highly-fractured and articulated volcanic rock with varying rock quality ranging from 5% (very poor rock) to 95% (very good rock), with no correlation between its quality and the type of rock or depth. This formation originates with both the presence of saline wedge that penetrates onshore, as well as the fact that the underground aquifer is deeper. In the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, there is a discontinuous layer of soil between 0 and 1.2-m deep with an average of 0.20 m made up of organic matter, sand, and gravel in different proportions depending mainly on the intensity of erosive factors (wind and water erosion).	Physiographic and geomorphological characteristics of the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project where the Modification will be carried out remain unchanged. The Modification is located in the physiographic province "Baja California Peninsula", in the sub-province "Mountain Ranges of Northern Baja California." The geomorphology of the Modification is characterized by having a massive granite nucleus of volcanic origin with a predominance of intermediate extrusive igneous rock. Its formation originated in the marine terraces' coastal zones and the emergent ones with the presence of cliffs. The Modification is located on a surface layer of residual soil that is on top of volcanic rock, which is relatively thin (less than 1-m thick) formed by sand and gravel. Cliffs are sequenced in layers of extrusive volcanic rocks, including basalts and andesites. Volcanic rock shows alternating flow units with breccia agglomerates and boulders (volcanic derivation conglomerate) that can be more than 60 meters with basalt and andesite; the volcanic sequence sinks between 5 and 10 degrees to the east. Cliff exposures have highly-fractured and articulated volcanic rock with varying rock quality ranging from 5% (very poor rock) to 95% (very good rock), with no correlation between its quality and the type of rock or depth. This formation originates with both the presence of saline wedge that penetrates onshore, as well as the fact that the underground aquifer is deeper.

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Authorized Project	Modification
In the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, there is a basaltic plateau, on a coastal terrace that extends to the southwest end of Punta Salsipuedes. This terrace surface has a slight slope toward the sea, with a maximum width of approximately 200 meters, at an altitude of 20 meters above average sea level (npm, for its abbreviation in Spanish). The eastern edge of the terrace, which is directed onshore, is bordered by a steep and rocky slope.	In the Modification, there is a discontinuous layer of soil between 0 and 1.2-m deep with an average of 0.20 m made up of organic matter, sand, and gravel in different proportions depending mainly on the intensity of erosive factors (wind and water erosion). The Modification is located on a basaltic plateau, on a coastal terrace that extends to the southwest end of Punta Salsipuedes. This terrace surface has a slight slope toward the sea, with a maximum width of approximately 200 meters, at an altitude of 20 meters above average sea level (npm). The eastern edge of the terrace, which is directed onshore, is bordered by a steep and rocky slope.
Seismic risk	
The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project are located in seismic risk Zone C, where earthquakes are less frequent and have an land acceleration of <70% severity, for which the risk is medium.	The seismic risk characteristics are maintained for the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project where the Modification will be carried out. The Modification is located in seismic risk Zone C, where earthquakes are less frequent and have a terrain acceleration of <70% severity, thus the risk is medium.
Geomorphological Hazards: Landslides, Collapses, and Liquefaction	
Due to the type of rock on which the ET-SAR is located with existing failures and fractures, there is a risk of landslides and collapse: sporadic. Regarding the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, the probability of a landslide or collapse event occurrence is from low to null. No soil liquefaction events have been recorded at the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area.	Characteristics of geomorphological risks due to landslides, collapses, and liquefaction are maintained for the ET-SAR. Characteristics of the geomorphological risks due to landslides, collapses, and liquefaction are maintained for the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area where the Modification will be carried out. There is a risk of landslides or collapses catalogued from low to null in the Modification area. No soil liquefaction event has been recorded in the Modification area.
Risk Due to Geological Failures and Fractures	
There are no Failures or Fractures in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area.	There are no Failures or Fractures in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area where the Modification will be carried out. There are no Failures or Fractures in the Modification area.
Slopes and Level Curves	
In the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, there are slope ranges from 0.0° to 5.0° and elevation ranges from 0.0 to 360 m a.s.l. with their respective level curves.	The slope and curve conditions are maintained in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project where the Modification will be carried out. In the Modification, there are slope ranges from 0.0° to 5.0° on approximately 97% of its surface and, due to the presence of discontinuities in the terrain originating with the presence of the cliffs and the basaltic plateau that formed platforms, there are elevations ranging from 0.0 to 280 m a.s.l. in sections of less than 100 linear meters, thus the slope ranges are from 10 to 50%, with their respective level curves.

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Authorized Project	Modification
Risk Due to Flood or Waterlogging	
In the ET-SAR, there has been specific and sporadic waterlogging associated with atypical rains, without there being a history of floods that represented a risk. There is no risk of flooding or waterlogging in the AI-T, the Authorized Project Polygonal area, and the Authorized Project area due to their volcanic rock base, the topography, and slopes.	Conditions for specific and sporadic waterlogging are maintained only in the ET-SAR, without this type of risk being present in the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area where the Modification will be carried out. There is no risk of flooding or waterlogging in the Modification area due to its volcanic rock base, the topography, and slopes.
Soil Types	
In the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, there are Feozem, Haplic, and Lithosol edaphological units (which makes them homogeneous environmental units for this factor). Through the profile analysis, it is known that its structure is shaped of fine sub-angular blocks with moderate development and Mollic denomination on Horizon A or the superficial part of the soil. Both soil types are susceptible to erosion.	In the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, the soil types in which the Modification will be carried out remain unchanged. The existing soil type in the Modification area is Lithosol and it is characterized by having a depth of less than 20 cm to the rock, caliche (*tepetate*, a type of brittle volcanic rock), or hard caliche (carbonated deposits). They have very variable characteristics, depending on the material that forms them, their susceptibility to erosion and their use varies depending on the zone where they are found and the vegetation that covers them. This region has an average texture in the upper 30 cm, and with respect to the 100-cm depth, there is a lithic physical phase consisting of a hard continuous rock layer or a set of very abundant rock pieces that prevents roots from penetrating. It has neither an organic-matter layer nor differentiated horizons.
Calculating Erosion or Soil Loss	
The results of calculating erosion for Scenario 1 or Current Total Erosion are: ET-SAR = 11,744.38 tonnes/year and its Erosion Index is Light. AI-T = 2,634.55 tonnes/year and its Erosion Index is Light. Authorized Project Polygonal Area = 1,824.79 tonnes/year and its Erosion Index is Light. Authorized Project = 593.60 tonnes/ha and its Erosion Index is Light. In Scenario 2, with clearing and cutting away activities, the Total Erosion results in the ET-SAR, the AI-T, and the Authorized Project Polygonal Area will remain unchanged, since their surfaces will remain unchanged. In the Authorized Project, with the clearing and cutting away of its surface, the Wind Erosion Index will be 145.40 tonnes/ha/year, the Water Erosion Index will be 11.25 tonnes/ha/year, and the Total Erosion Index will be 156.65 tonnes/ha/year, which is qualified as High. In Scenario 3, with Mitigation actions carried out at the Authorized Project, the Wind Erosion Index will be 5.45 tonnes/ha/year, the Water Erosion Index will be 0.00 tonnes/ha/year, and the Total Erosion Index will be 5.45 tonnes/ha/year, which is qualified as Light.	In the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, Scenarios 1, 2 and 3 remain unchanged. Regarding the Modification in Scenario 1, the Wind Erosion Index is 3.60 tonnes/ha/year, the Water Erosion Index is 0.63 tonnes/ha/year and the Total Erosion Index is 4.23 tonnes/ha/year, so the Total Erosion is 19.16 tonnes/year. The Total Erosion Index is classified as light. For Scenario 2 of the Modification and with the Clearing and Grubbing activities, the Wind Erosion Index is 36.35 tonnes/ha/year, Water Erosion Index is 6.37 tonnes/ha/year and the Total Erosion Index is 42.72 tonnes/ha/year, thus the Total Erosion is 127.74 tonnes/year. The Total Erosion Index is classified as light. For Scenario 3 of the Modification, the areas with Rosette-like Coastal Scrub vegetation (299 ha) will be fully used for the Modification and there will be concrete slabs thereon; therefore, the Wind, Water, and Total Erosion Indexes will be 0 (zero).

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Authorized Project	Modification
If Scenario 1 or the current erosion in its Total Erosion Index (5.47 tonnes/ha/year) is compared with Scenario 3 (5.45 tonnes/ha/year), it is observed that the mitigation measures improve natural conditions of the Authorized Project area, since a reduction of 0.02 tonnes/ha/year is achieved, which means a Total Erosion of 591.72 tonnes/year, below the current Total Erosion of 593.60.	Appendix IV.1 includes the erosion calculation for the 3 indicated scenarios in an Excel format, with the operations performed.
Surface Hydrology	
Hydrological Regions The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project are located in Hydrological Region 1 "Northeast Baja California" which covers approximately half of the municipality of Ensenada, which is subdivided into three basins: Basin (1A), Escopeta-Cañón de San Fernando Creek; Basin (1B), Las Animas Creek-Santo Domingo Creek; Basin (1C), Tijuana River-Maneadero Creek. Basin 1C, Tijuana River-Maneadero Creek, contains "El Farito" Sub-basin, which covers the entire ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project. **Perennial and Intermittent Streams** There is only intermittent surface runoff.	**Hydrological Regions** Characteristics related to the surface Hydrology at the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area where the Modification will be carried out remain unchanged. The Modification is located in Hydrological Region 1 "Northeast Baja California", in Basin (1C), Tijuana River-Maneadero Creek, in "El Farito" Sub-basin. **Perennial and Intermittent Streams** The existence of intermittent surface streams in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area remain unchanged. In the Modification area, there are only intermittent surface streams, which will not be affected in any way.
Underground Hydrology	
The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area are located entirely in the "Ensenada" aquifer area, CONAGUA code 0211, whose water balance published in the DOF on April 20, 2015 indicates a deficit of -6.807665 million m^3/year. The aquifer administrative situation is the closure validity that covers the entire state of Baja California (published in the DOF on May 15, 1965); it only allows limited extraction for domestic, industrial, irrigation, and other uses, preceding technical study and authorization by CONAGUA. CONAGUA establishes, in its annual publication "Water Statistics in Mexico 2015", that the "Ensenada" aquifer has marine intrusion; that is, sea water flows onshore into the superficial part of the aquifer and a mixture of sea water and fresh water originates, which comes from rainfall. A characteristic of coastal aquifers is that rainwater infiltrating near the beach or cliffs flows toward the sea due to the land slope, as the existing one in the ET-SAR and AI-T; therefore, rainwater in this area does not refill the aquifer. In addition, the aquifer has a saline intrusion, due to the fact that its predominant flow is toward the southwest.	Characteristics related to underground hydrology in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area remain unchanged. The Modification is located in the "Ensenada" aquifer area, CONAGUA code 0211, which water balance studies published in the DOF on April 20, 2015 indicate a deficit of -6.807665 million m^3/year, under the same closure and saline intrusion conditions that apply to the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area. The Modification will have no interaction on the aquifer, its refill area, and restrictions imposed by the closure. The "Ensenada" Aquifer information is updated according to the provisions in the "AGREEMENT that updates average annual groundwater availability of the 653 aquifers in the United Mexican States, which are part of the indicated Hydrological-Administrative Regions" published in the DOF on January 4, 2018, for the Modification. Average annual refill (R): 3.7 Compromised Natural Discharge (DNC, for its abbreviation in Spanish): 0.0 Concessioned Volume/Assigned Groundwater (VCAS): 10.848974 Mm/m^3.

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Authorized Project	Modification
(PIAE, 2008) This mixing phenomenon is greater in the beach and cliff area, and may cover up to one kilometer onshore.	Water Extraction Volume in the provisional suspension zones for Free [underground water] Extraction and those registered with the Permanent National Registry (VEALA): 0,000000 Mm/m^3. Water Extraction Volume Pending Certification and/or Registration with REPDA (VAPTYR): 0,000000 Mm/m^3. Water Volume that corresponds to reserves, regulations, and Water Scheduling (VAPRH): 0.000000 Mm/m^3. Average Annual Positive Underground Water Availability (AMD): 0.000000 Mm/m^3. Average Annual Negative Underground Water Availability (AMD) (Deficit): - 7.148974 Mm/m^3. Mm/m^3 = Billions of m^3 **Current Legal Instruments** The administrative state of the aquifer is the closure validity that covers the entire state of Baja California (published in the DOF on May 15, 1965); it only allows limited extraction for domestic, industrial, irrigation, and other uses, preceding technical study and authorization by CONAGUA. **Groundwater Quality and Aquifer Issues** There is no information on the "Ensenada" Aquifer in the DOF published on April 20, 2015, nor in the AGREEMENT published in the DOF on January 4, 2018.
Calculating Infiltration into the Aquifer	
Calculating aquifer infiltration in the ET-SAR and Authorized Project areas, for three scenarios. Scenario 1, without the presence of the Authorized Project or for current natural conditions. In the ET-SAR, there is an infiltration of 409,823.99 m^3/ha and, when multiplied by the total surface area with Rosette-like Coastal Scrub (1,593.96 ha), a total of 653,243,043.82 m^3 is captured. In the Authorized Project area, rainwater capture is 42,767.58 m^3. It is necessary to indicate the water cycle in the Authorized Project area is that where rainfall infiltrates into the natural soil, which feeds the saline wedge and finally returns to the sea, not refilling the aquifer. Scenario 2, with Clearing and Grubbing activities in the Authorized Project area, infiltration would be 4,69 8,2 3 6.80 m^3. In the ET-SAR, no action will be taken in terms of its natural coverage; therefore, it remains unchanged. Scenario 3, applying Mitigation measures in the Authorized Project area, rainwater capture will be 4,508,975.98	In the ET-SAR and the Authorized Project areas, Scenarios 1, 2, and 3 remain unchanged. In Appendix IV.2 (in Excel format and with the operations performed), the Infiltration calculation for the Modification in its 3 Scenarios is updated: Scenario 1 under current natural conditions, Scenario 2 with Clearing and Grubbing activities, and Scenario 3 with the Project. It is necessary to emphasize that Rainfall does not refill the Aquifer due to the existence of a saline wedge that carries rainfall into the sea, which was demonstrated in the Authorized Project. The update includes using the method indicated in Mexican Official Standard NOM-011-CONAGUA-2015, published in the DOF on March 27, 2015, and in the "Annual Average Water Availability Update for the Villa Victoria-Valle de Bravo Aquifer (1505), State of Mexico", published in the DOF on April 20, 2015, and In the Modification, in Scenario 1 or under current natural conditions, it results in an Infiltration Volume [V_{INF}] (m^3/year) = 237.0551

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The Authorized Project will originate an increase in rainwater capture due to the mitigation measures to be implemented and over which the evapotranspiration factor of vegetation coverage will not influence capture or runoff. However, it is important to remember that the Authorized Project area does not contribute water to the aquifer due to the presence of saline intrusion and the water cycle in the zone is that rainfall, and its infiltration up to one kilometer from the marine coastline, mixes with seawater and migrates toward it, without the aquifer being refilled. The presence of the Project and its measures will keep this water cycle unchanged.	In the Modification and with Scenario 2 or with the presence of the Project and Clearing and Grubbing activities, the Infiltration Volume [VINF] (m^3/year) = 235.2661. In the Modification and with Scenario 3 or with the presence of the Project and Clearing and Grubbing activities, the Infiltration Volume [VINF] (m^3/year) = 235.2661. The difference between Scenario 1 and Scenario 3 is 1.78 m^3/year. However, it is important to remember that current rainfall capture in the Modification area does not refill the aquifer due to the existence of a saline wedge.
Abiotic Aspects of the EM-SAR	
Delimitation of the EM-SAR was carried out through delimitation of the coastal Intercell area.	Delimitation of the EM-SAR remains unchanged.
Geology	
In the EM-SAR area, the geology of the seabed and underlying layers is rocky, moderately tilted toward the coast and gently falling into the high seas. The coast tilts into the high seas at a gradient of 0.067 or a slope of 15 m horizontal to 1 m vertical (15:1). The rock is visible along the coast and up to a depth of 5 to 30 meters. The rocks are covered during high seas by a light layer of sand material with a relatively smooth surface. Sand distribution on the seabed is over a gradient of 0.042 or a slope of 24 m horizontal to 1 m vertical (24:1).	Geological characterization of the EM-SAR remains unchanged and applies to the Modification.
Coastal Dynamics	
Coastal dynamics of the EM-SAR is determined by wind and surge, which forms coastal cells and subcells or Intercells. Coastal cells refer to a coastal segment within which sediment transportation completes an entire supply cycle, distribution and losses, in such a way that there is no material exchange among adjacent cells. The EM-SAR is located on the border between 2 Intercells, the first one extending 1.5 km north of the study area and the second one covering and area approximately 2.0 km south. In the EM-SAR, there are two well-differentiated surge regimes for winter (November-May) and summer (June-October), which is confirmed through the Wave Rose, since it has a 202.5° south-south westly direction with in summer and a 270° westerly direction in winter. It's a high energy zone due to the surge regime. In the EM-SAR, there is a tsunami risk for distant earthquakes and a mean sea level rise from 2.0 to 4.0 for a return period of 100 years. In the AI-M and the Project areas, the coast is rocky due to igneous material outcrop, formed largely by medium-height cliffs (3 to 15 m) with signs of great stability and minimal erosion. Beaches are formed by medium-sized boulders (between 10 and 50 cm) without the presence of sandy beaches due to the direct action of open sea surge, as it is a high-energy area; in some low-energy areas, there are beaches formed by oversize boulders, between 10 and 50 cm.	Characterization of the coastal dynamics in the EM-SAR remains unchanged and applies to the Modification.

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Authorized Project	Modification
Seabed bathymetry was measured every 10 m and describes an area of plains, depressions, and wells. Coastal dynamics are ruled by prevailing northwesterly winds, strong westerly seafloor in winter as a result from cyclonic events in the northwestern Pacific Ocean and smaller south-south westerly seafloor due to events in the southern Pacific Ocean. The surge is the main forcing mechanism for generating coastal streams and therefore the cause of sedimentary material transport (coastal transport). Modeling results showed that, in the study area, the net coastal stream direction is north-easterly during the summer season and south-easterly during the winter season, which causes erosion to the east of the MOF in the winter season, and within the Project's AI-M, and sediment accumulation to the west and vice versa during summer conditions. Likewise, modeling results indicate that after a 60-day simulation, the system reaches a balance, stopping after this erosive processes period and the accumulation of sediments, whatever their origin may be (natural, dredging, soil dragged from land), thus the area affected by the MOF will reach approximately 600 m in a South-East and North-East direction, parallel to the coastline, to return to its natural state or balance in 60 days. Surge is the main forcing mechanism for generating coastal stream, and modeling results showed that, in the study area, the net coastal stream direction is Northeast during the summer season and Southeast during the winter season. There is a tsunami risk for distant earthquakes and average sea level rise from 2.0 to 4.0, for a return period of 100 years. In the AI-M of the Project, there is a breakwater that has a theoretical probability of the presence of geological fault. In the same way, there is a low theoretical probability of seabed liquefaction occurring.	
Marine Water Quality	
There are seawater discharges in the AI-M of the Project area, coming from the Regasification Plant, which do not exceed the maximum permissible limits, and are also expected from the 36 CC Baja California III Project (La Jovita Site) when it starts its operation and maintenance stage. For seawater quality in the AI-M, the values obtained for temperature and salinity indicate that the AI-M is homogeneous from an oceanographic point of view, and in accordance with the reports for the California Stream, with typical salinities of 33:4 ups. Therefore, the differences were statistically non-significant among stations.	The EM-SAR seawater quality characterization remains unchanged and applies to the Modification, as well as its Baseline.

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Authorized Project	Modification
However, when comparing values among different depths, the differences are statistically significant with a high vertical stratification due to density differences between the surface and the bottom. The aforementioned as a result of solar radiation water heating, and its physical difference if the sample is collected at a 0 m or at a 30-m depth. The temperature parameter is sensitive enough to indicate that hot water entering from the Salsipuedes Bay, which is mixed with colder water from the north, is more noticeable on the surface. This also impacts biological processes that determine the pH, oxygen, and nutrient variables. The pH and oxygen variables showed statistically-important differences among depths as a result of stratification, and greater values in the north, due to the effect of phytoplankton growth at the subsurface between 10-20 m) where chlorophyll showed its maximum concentration. Nutrients show statistical differences at depths, as a consequence of the same stratification; however, their distribution is typical for a nutrient (increasing with depth) in the marine environment. In their horizontal distribution, they do not show any correlation with temperature or salinity, which suggests their concentrations are ruled by biological processes or contributions by resuspension of bottom sedimentary material, especially in the central part of the AI-M, where they find the highest concentrations of nitrates and phosphates, although there is not enough conclusive evidence. This same factor could alter, albeit slightly, iron, calcium, magnesium, and sulfate concentrations, since their minimums or maximums are in the same seasons. Despite this, concentrations of metals such as lead, cadmium, or the same suspended solids, were not significantly altered as demonstrated by the applied ANOVA tests. Therefore, the variables and their values measured in this study constitute the Seawater Quality Baseline for prevailing oceanographic conditions in the AI-M and at the time of year of the sampling, which is also supported because values found were within the values reported by other authors for the region. With respect to seawater quality in the ET-SAR, the sampling corresponds to the month of August and it was possible to identify the influence of the California Stream water on the northern part of the study area, with a typical salinity of 33.5 ups and a 16°C temperature with nutrient input (such as nitrates, nitrites, phosphates, and iron), which enriches the area, since they are used by primary producers. This water also had a low-oxygen content, especially in the northern part (corresponding to Transect 11) with relatively low pH values, which suggests the sampling was taken after an upwelling event, and therefore, temperatures and salinities showed significant differences among depths, which indicates a good stability in the water column with a low vertical mixture.	

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Authorized Project	Modification
Differences were significant (confidence level greater than 70%) among nutrient depths (nitrates, nitrites, phosphates, total nitrogen) and iron. These properties showed typical nutrient behavior with maximum concentrations at the bottom and a decrease in their concentrations in medium-depth water, due to their consumption by primary producers. Preservative properties, such as calcium, magnesium, and sulphates, did not show important variations in the water column, nor among seasons, since they showed typical values of natural seawater, without observed anomalies by external elements. It is worth mentioning that the values reported for all variables were within values considered to be natural for a coastal zone, by different authors.	
Land Biotic Environment	
Areas of Environmental Importance	
Floristic Province The ET-SAR, AI-T, Authorized Project Polygonal Area, and the Authorized Project area are immersed in the "California" Floristic Province. **Priority Land Region (RTP)** The ET-SAR, AI-T, Authorized Project Polygonal Area, and the Authorized Project area are located in the southern part of the "Santa María-El Descanso" RTP-10 Priority Land Region. **Priority Land Sites (SPT)** The AI-T, Authorized Project Polygonal Area, and the Authorized Project area are partially within SPT-54 (northern part), with 801.11 ha having a medium priority (N = 1,093). Each SPT has an area of 256 km^2. **Priority Epicontinental Aquatic Sites (SPAE)** Each SPAE has an area of 25 km^2. The ET-SAR affects the west with SPAE key 23273 on 1,767.39 ha and the Project Polygonal Area on 0.73 ha has no impact the Authorized Project area.	The ET-SAR, AI-T, Authorized Project Polygonal Area, and the Authorized Project area influence on the Floristic Province, the Land Priority Site, and the Priority Epicontinental Aquatic Sites, remain unchanged. The Modification is located only in the "California" Floristic Province and the "Santa María-El Descanso" Priority Land Region 10.
Vegetation Characterization	
Land use and vegetation (US and V for their abbreviation in Spanish) characterized at the cartographic level, using INEGI's Series V (2013) are indicated below: US and V for the ET-SAR: Agricultural-Livestock-Forestry (214.76 ha), Human Settlements (306.04 ha), Bodies of Water (27.76 ha) and secondary vegetation (VSa) of Rosette-like Coastal Scrub (1,593.96 ha). The US and V in the AI-T are:	The US and V is updated at the cartographic level using INEGI's Series VI (2017) for the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area; based on its analysis, the vegetation type (shrubby Secondary Vegetation of Rosette-like Coastal Scrub) and the Use of Bodies of Water remain unchanged. The "Human Settlements" classification was replaced in Series VI by "Urban Construction".

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Authorized Project	Modification
Bodies of Water (12.82 ha) and VSa of Rosette-like Coastal Scrub (467.25 ha). The US and V in the Authorized Project Polygonal Area are: Bodies of Water (12.82 ha) and VSa of Rosette-like Coastal Scrub (320.17 ha). The US and V in the Authorized Project are: Bodies of Water (1.40 ha) and VSa of Rosette-like Coastal Scrub (108.94 ha) and an area without vegetation that corresponds to roads, fences, etc. of 18.76 ha. Results from fieldwork indicate that in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project area, the existing vegetation type is Rosette-like Coastal Scrub as primary vegetation. In addition to the fieldwork carried out, it is important to mention that the vegetation sampled in the Project Polygon area corresponds to ecological restoration areas for the affected native ecosystem of Rosette-like Coastal Scrub, due to the fact that activities related to restoration and compensation were carried out to comply with the Rescue, Protection, and Preservation of Wild Flora Program and the Forestation and Reforestation Program to compensate for the change in forest land use, executed from 2006 to 2012, when the goals and objectives set out in these programs were met; however, maintenance activities continued for weed control, nursery plant production, reforestation with nursery organisms, etc. The Program areas have a total surface of 139.80 ha, which are immersed in the Project Polygon. Therefore, even though the vegetation type was confirmed in the field as Rosette-like Coastal Scrub, these areas correspond to ecological restoration zones for the native ecosystem, which influences the existence of a variation in the results with respect to the ET-SAR, in biodiversity and richness. The same number and area were sampled within the Authorized Project area and the ET-SAR for the Rosette-like Coastal Scrub vegetation type, under the same methodology and representative of the sampling. The ET-SAR showed an abundance of 1,432 organisms with 18 families and 22 species, and in the Authorized Project area, with 1,190 organisms from 11 families and 17 species. Results from the Resources analysis, Diversity Indexes (Shannon, H'max, Equitability) and Importance Value confirm the fact that the only existing natural vegetation type is the Rosette-like Coastal Scrub, whose greatest resources are found in the ET-SAR at a family, species, and individual level. With respect to the Shrubby Stratum, the ET-SAR and Authorized Project areas show a low diversity of species, but a high equitability; therefore, there are no species that behave in a dominant manner.	At the cartographic level, using INEGI's Series VI (2017), the Modification area corresponds to shrubby Secondary Vegetation which corresponds to Rosette-like Coastal Scrub. Rosette-like Coastal Scrub characteristics are updated according to the Cartographic Interpretation of Land Use and Vegetation Guide (Scale L2SO 000), Series VI, INEGI (2017): Rosette-like Coastal Scrub is a community characterized by species with rosette leaves, defenseless and thorny shrubs under the influence of marine winds and fog, in the northwestern portion of the Baja California peninsula. It is distributed throughout Ensenada, Cabo Colonet, Cabo San Quintín, and Punta Santa Rosalía, all in Baja California, in Very dry (BW) and Dry (BS) climates, with the maximum temperature being 48°C and the minimum being -3°C, and with an average annual rainfall of 160 mm, distributed in the winter; this vegetation develops up to 1,300 m, on hilly land, plateaus, and mountain ranges, located as well in valleys and plains. It has two strata, one shrubby and the other one herbaceous; the first one with species with a height of 0.2-0.4 m, which is the dominant stratum, and the herbaceous one with a height of 0.1-0.2 m. Its main species are: Agave *shawii* (Maguey), *Bergerococtus emoryi* (Velvety cactus), *Dudleya spp*. (Sempervivum). *Euphorbia misera, Eryogonum fasciculatum, Ambrosia californica, Rosa minutifolia, Bahiopsis laciniata*, etcetera. In some areas, it is widely mixed with Chaparral elements. Vegetal communities show successive phases known as "Secondary Vegetation" which can naturally and over time favor the recovery of original vegetation. Because of the complexity of defining successional phase types, given their floristic and ecological heterogeneity and their difficult interpretation, even in the field; based on life forms present and their height, three phases are considered, one of which is the shrubby Secondary Vegetation (code VSa). Land vegetation characterization, its Biodiversity, and Abundance in the ET-SAR, as well as the Authorized Project, remain unchanged. The field sampling process and biodiversity and resources results obtained in the Modification are discussed in detail in the following section.

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Authorized Project	Modification
Through Diversity Indexes, the ET-SAR showed a greater diversity of species and equity in terms of species distribution, frequency, abundance, and composition. In the succulent stratum, both in the ET-SAR and the Authorized Project shows a low diversity and as for equitability, the Authorized Project shows a greater equitability of species in terms of their abundance and distribution; this indicates that, in spite of showing some species with greater abundances, these do not show a dominant behavior; therefore, their distribution and abundance is very similar. The high diversity, abundance, and distribution of shrubby organisms in the ET-SAR is due to the fact that the distribution of this type of flora is poor on the coastline due to intolerance of the presence of salt in the water, thus its greater distribution is at altitudes of 300-1,200 meters above sea level. The succulent group in the Authorized Project area showed a greater floristic diversity in terms of abundance, distribution, and abundance of species than in the ET-SAR. This difference is due to the implementation, from 2006 to date, of the compensation or restoration program, where wild flora rescue, protection, and preservation activities were carried out, and the forestation and reforestation program to compensate for the change in forest land use at the Regasification Plant. Land flora species under some form of national and international protection instrument are: *Bergerococtus emoryi* (Velvety cactus): IUNC (LC) and CITES (Appendix II). *Ferocactus viridescens* (Biznaga cactus): NOM-059 (A), IUNC (LC). Agreement and CITES (Appendix II). *Mammillaria dioica* (Biznaga llavina cactus): NOM-059 (Pr), IUNC (LC) and CITES (Appendix II). *Cylindropuntia cholla* (Coastal cholla): IUNC (LC) and CITES (Appendix II). *Opuntia littoralis* (Nopal): IUNC (LC) and CITES (Appendix II). **NOM-059:** Official Mexican Standard NOM-059-SEMARNAT-2010. A: Threatened. Pr: Special protection. **IUNC:** Red List of the International Union for Nature Conservation. LC: minor concern. **CITES:** Convention on International Trade of Wild Flora and Fauna. **Agreement:** Agreement that discloses the list of priority species and populations for preservation, published in the DOF (*Diario Oficial*) on January 30, 2014.	
Fauna Characterization	
The ET-SAR, AI-T, Authorized Project Polygonal Area, and the Authorized Project area are located in the Nearctic Region within the Californian Province and the Californian Herpetofaunistic Province.	Land fauna characterization, its Biodiversity and Abundance in the ET-SAR, as well as the Authorized Project, remain unchanged.

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Authorized Project	Modification
There is no AICA in the ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project. In the ET-SAR there are 73 organisms of 15 species, 8 of which are birds, 3 are reptiles, and 4 are mammals; in the Project area, there are 60 organisms of 11 species, 6 of which are birds, 2 are reptiles and 3 are mammals. Mammals in the ET-SAR (4 species) have a low diversity and in the Authorized Project, it is lower (3 species); this is due to the fact that *Lynx rufus, Canis latrans,* and *Peromyscus sp.* have a greater resistance to human presence in the ET-SAR. Out of the 4 species in the ET-SAR (*Conis latrans, Lynx rufus, Lepus californicas,* and *Peromyscus sp.*) only 3 were observed in the Modified Project area (*Canis latrans, Lynx rufus,* and *Peromyscus sp.*). Based on the aforementioned, the following results are explained: - Maximum diversity (H'max) is greater in the ET-SAR than in the Authorized Project. - Equitability in the ET-SAR is greater than in the Authorized Project (there is a difference of 6 and up to 11 individuals among species), while the 4 species in the ET-SAR have a difference of 1 to 3 individuals. - Birds diversity is greater in the ET-SAR than in the Authorized Project. - Maximum diversity (H'max) is greater in the ET-SAR than in the Authorized Project. - Equitability Indexes in the ET-SAR indicate an equitable bird distribution, although there are differences in abundance within each species, they are not very great. In the Authorized Project, greater equity is maintained due to the lower number of organisms of each species. - Reptiles in the ET-SAR have more diversity than in the Authorized Project. - The species identified in the ET-SAR (*Sceloporus sp., Aspidoscelis sacki,* and *Crotalus sp.*) were not observed in the Authorized Project and vice versa, because they are linked to specific microenvironments due to the fact that within the Authorized Project, there are fauna brigades in charge of capturing and relocating reptiles in places that have characteristics similar to the original site from which they were extracted. - Maximum diversity (H'max) is greater in the ET-SAR than in the Authorized Project. - The Equitability Index in the ET-SAR is lower than in the Authorized Project; however, no species within the ET-SAR and the Authorized Project overlap the others. Land fauna species under a form of national and international protection instrument are:	The field sampling process and biodiversity and abundance results obtained in the Modification are discussed in detail in a specific section below.

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Authorized Project	Modification
Aspidoscelis sacki (Stained huico): IUNC (CLC). *Bogertophis rosaliae* (Mouse snake): IUNC (LC). *Buteo jamaicensis* (Red-tailed eagle): IUNC (LC). *Cathartes aura* (Aura vulture): IUNC (LC). *Melospiza melodio* (Singing sparrow): IUNC (LC). *Falco peregrinus* (Peregrine Falcon): NOM-059 (Pr), IUNC (LC) and CITES (Appendix I). *Thryomanes bewickii* (Dark-tailed chivirin): IUNC (LC). *Callipepla californica* (California quail): IUNC (LC). *Tyrannus vociferans* (Screaming tyrant): IUNC (LC). *Larus occidentalis* (Dark gull): IUNC (LC). *Carpodacus mexicanus* (Mexican chaffinch): IUNC (LC). *Pelecanus occidentalis* (Brown pelican): IUNC (LC). *Canis latrans* (Coyote): IUNC (LC). *Lynx rufus* (Wildcat): IUNC (LC). *Lepus californicus* (Black-tailed Hare): IUNC (LC). **NOM-059:** Official Mexican Standard NOM-OS9-SEMARNAT-2010. A: Threatened. Pr: Special protection. **IUNC:** Red List of the International Union for Nature Conservation. LC: minor concern. **CITES:** Convention on International Trade of Wild Flora and Fauna. **Agreement:** Agreement that discloses the list of priority species and populations for preservation, published in the DOF (*Diario Oficial*) on January 30, 2014.	
Marine Biotic Environment	
Priority Marine Regions The Authorized Project is located entirely within Priority Marine Region RMP No. 1 called “Ensenadense”, which is a high diversity area with an extension of 27,453 km^2, which includes scrub area, coastal dunes, oceanic areas, islands, lagoons, bays, beaches, marshes, and cliffs.	The location and impact of the Authorized Project in the “Ensenadense” Priority Marine Region remain unchanged and apply to the Modification.
The study carried out in the Project’s AI-M serves both for biotic characterization (marine flora and fauna) and establishing the Project Baseline, as it describes and analyzes the marine biotic factor without presence of the Project. The study of the AI-M comprises the Intertidal zone at three levels (Upper or Supralittoral, Medium or Mesolittoral, and Low or Infralittoral) and the Subtidal zone. In turn, the three section of the Intertidal zone were studied: North, South, and Central. For each zone and level, the Shannon Index, Species Abundance, and Simpson Index values were obtained, and their integration is presented below. **Integration of the 3 Sections (North, Center, and South)** The 3 sections show a diverse and variable community of benthic flora and fauna. Species described in the study are typical ecological components of an exposed, high-energy, rocky coastline in Baja California.	The biotic environment characterization in the AI-M of the Authorized Project remains unchanged and applies to the Modification.

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However, this community is subject to changes in its biotic components, depending on different environmental variables, typical of this location, such as substrate (rock, rock type, sand), the surge energy to which the coast is exposed, its health environment due to water quality and anthropogenic activities, such as direct organism extraction by fishermen or visitors, infrastructure construction, or industrial operations. The substrate is a relevant factor, since it is what provides habitat for benthic organisms, in addition to providing protection and moisture. A smooth and relatively flat rocky substrate will leave organisms exposed to the sun and degradation, as it occurs with rocks that make up most of the coastal Intertidal in the Northern Section. In this Section, large, irregular, rounded rocks dominate, which have been smoothed by waves and sand abrasion, thus adhesion and colonization of organisms is more limited. Due to this, and also because of the strong surge, organisms become detached more easily. In addition, it is difficult for them to preserve the moisture they need when exposed to a low surge. **Marine Flora, Intertidal, North, Center, and South Sections** The environmental variables described above affect species abundance, mainly in the Northern Section, obtaining lower values of up to zero, especially in the Upper level, in comparison with the other Central and Southern sections, where abundance values of 9 and 6 were obtained in the same level, respectively. Likewise, a tendency toward lesser species abundance was obtained in the Northern Section, in the medium and low levels. In the same way, in the North Section, the lowest values in the Shannon Index were obtained from zero, due to an absence of algae in the Upper level and a lower values tendency in the medium and lower levels, with respect to the Center and South sections. The above is also a consequence of the difference among the abundance values per coverage of algae species present among sections. These indicators in the Intertidal of the North Section describe a low-stability benthic community. The aforementioned is due to a low species abundance and the lowest equity in density of the species present. In this subtidal of this Section, the species abundance was 29, with a tendency to increase toward the Center and South sections, where values of 40 and 43 were obtained. For its part, the Shannon Index values showed the same tendency toward lower values in the North Section and a tendency to increase toward the Center and South sections. In general, these Index values are low and fluctuated from 1.10 to 3.76, which means that, in this algae species diversity, there are few species with a high density and most are low density, with great heterogeneity.	

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In the Center and South sections, environmental characteristics such as the substrate are more similar, since the rocky substrate is more irregular, with rocky promontories, tidal pools, and small protruding platforms; however, energy conditions are different. In the Center Section, there is less surge energy due to the breakwater protection, and energy increases towards the South Section, due to the fact that it receives less protection from it. Species abundance values were very similar in the Intertidal of the Center Section (Upper 9, Middle 32, and Lower 26), and the South Section (Upper 6, Medium 39, and Low 30). In the same way, the Shannon Index values were generally very similar in the Intertidal between the Center and South sections, with a slight tendency to be higher in the South section. In the subtidal, the species abundance is very similar to the Central and Southern sections, but slightly higher in the Southern Section, with 40 and 43 respectively, being higher than in the Northern Section. For the Shannon Index, its values are also very similar to the Center and South sections, but slightly higher in the Center Section, which reaches 3.76, while in the South Section, it reaches a maximum of 3.64 and is slightly higher than in the North Section. These are consistent with the Simpson Index values, which are generally lower in the North Section compared to the Center and South Sections, which are on average 0.72 and 0.80 respectively, against the value of 0.21 in the North Section. This set of results defines the subtidal in the Central and Southern sections as a more stable community than the Northern Section. The results obtained from the marine flora of the Intertidal and subtidal allow assertion for a diversity of species in the benthic community organisms, except in specific cases. This situation is common in communities that do not have a high level of stability. Despite this, it shows itself as a well-established benthic community. The variability of rock substrates tends to be favorable to diversity, providing diverse characteristics in the habitat, which favor colonization and survival of the species. However, smooth rocky substrates in high-energy environments are not the most suitable for establishing and developing algae, on the contrary, rocky substrates with porous surfaces provide a better habitat for algae establishment and development. **Marine Fauna, Intertidal, North, Center and South Sections** The substrate and energy factors described affected the species abundance, since the North Section, with smoother and less irregular substrates showed, in comparison to the other sections, the lowest values in the Intertidal Medium and a lower level. Also, in this Section, the lowest values for the Shannon Index were obtained, since in 14 out of 15 transects of the Intertidal, the values were less than 2, which means there is a large difference in density values of the species present. These indicators describe a benthic community of low stability. This is also due to the low species abundance and a lower equity in density of the species present.	

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Authorized Project	Modification
In the subtidal of this Section, the species abundance was 25, similar to that in the other sections, but the Shannon Index values were in all cases less than 2, which means that, for this species diversity, there are few species with a high density and most are of low density, confirming the conclusion. In the South and Center sections, substrate characteristics are more similar to each other, with a more irregular rocky substrate, rocky promontories, tidal pools, and small protruding platforms. However, energy conditions are different. In the Center Section, there is less surge energy due to the breakwater protection, and energy increases toward the South Section, due to the fact that it receives less breakwater protection. Species abundance was very similar in the Intertidal of the Center Section, (Upper 19, Medium 22, and Lower 23) and the South Section (Upper 18, Medium 25, and Low 24). However, the Center Section exceeds the South in its Shannon Index values, which in one of its' transects reaches a value of 3.9, and in the South the maximum is 2.4. In the subtidal, species abundance is greater in the Southern Section, with 28, in comparison to 24 in the Central Section. These differences seem to be a consequence of the greater energy in the Southern Section, since they have a presence of 2 sponge species, *Acarnus erithacus ssp.* and *Cliona sp.*, which are characteristics of environments with greater energy provided by streams and/or surge. However, the Central Section has greater Shannon Index values of up to 3.1, while the Southern Section has a maximum of 2.5. These are consistent with the Simpson Index values, which are lower in the Center Section, on average 0.04, and in the South Section, they are 0.18; therefore, this set of results defines the Center Section as a more stable community. A general analysis of the study area allows affirmation that species diversity in this benthic community as a whole is not high, nor is the density of most organisms. The above is common in many communities that do not have a high level of stability. Nevertheless, it is a well-established benthic community that has competitive relationships for space and food, which are inherent in this type of intertidal communities on rocky substrates. Environments with greater energy favor the presence of filtering organisms, such as mussels, *Mytilus californianus*, barnacles; *Pollycipes polimerus*, Balanidae and Chtamalus which, due to being filtering organisms, seek very exposed, high energy spaces, which facilitate availability of particles when water passes, which serves as food for them. A good example of the variability of this community are the different Abundance Index values for species found in each of the Intertidal levels when comparing the adjacent Sections, both for flora and fauna. In the same way, there were different values for the Shannon and Simpson Indexes among transects in the same Section, as well as among Sections.	

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Shannon values were generally closer to 2 and only rarely reached 3. Simpson Index values were high, showing very heterogeneous relative densities, with little numerical equity of density in the species present; i.e. a few dominant species and many with very low values. A great heterogeneity, which is typical of less stable communities. This was evident mainly in the North and South Sections. The greatest algae diversity was obtained in the Center and South Sections, especially in the Intertidal, while the greatest fauna diversity was shown in the Center Section. The Center Section was impacted from 2005 to 2008 by the Marine Terminal construction. However, it shows a state of recovery, and a favorable state for its benthic community, since it has been favored for being a zone excluded from marine species extraction. Its Diversity Indexes and densities indicate a better ecological status in the benthic community. This is based on information obtained from the diversity and density assessments and comparing it to other Sections. A remarkable example is the presence and abundance of black abalone *Haliotis cracherodii*, which was previously very scarce. Black abalone *Haliotis cracherodii* is a highly-sought-after species in the food industry. This has an important presence in the Intertidal zone, and only a few dispersed organisms were found in the subtidal zone. During the sampling activities, the presence of several black abalone shells in the Intertidal zone was evident, which indicates illegal fishing of this species in the area. In particular, the red hedgehog herbivorous species *Strongylocentrotus franciscanus* (today called *Mesocentrotus franciscanus*) tends to be extracted in large quantities due to it being fished. Empty spaces are being naturally occupied by the purple hedgehog species *S. purpuratus*, which is more voracious and removes algae from its fixed structures, altering the availability of the substrate, food, and diversity. In these types of communities, there are natural seasonal fluctuations influenced mainly by temperature, due to the latitude where the study area is located and the time of year. Therefore, their community is subject to the presence of opportunistic species, which respond in the short term in their development and settlement of species by seasonality (differences in the summer and winter). In the three sections, a large number of seasonal algae species were identified. Likewise, the presence of introduced/invasive macroalgae species, such as *Sargassum muticum, Sargassum horneri,* and *Undaria pinnatifida*, was also detected, with the first two having high density and relative frequency values throughout the study area. This presence influenced the composition of the species and the values of the Indexes calculated mainly in the subtidal zone of the Northern Section. Its introduction and displacement off the coast of Baja California is considered accidental. *Sargassum mutkum* was first reported in 1973, while *Sargossum horneri* in 2005.	
Marine mammals	

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Studies on marine mammals were carried out in 2014/2015. The number of species present in 2014/2015 was similar to that observed in the reference period (2003/2006). As for the relative abundance of species, it may be concluded that the gray whale species (*Eschrichtius robustus*) and common dolphin (*Delphinus delphis*) are dominant at Costa Azul from December to April, with the first one being a species with a migrant population and the second one with a resident population. The relative abundance of Marine Mammal species in 2014/2015, although slightly higher than in previous years, is not significantly different from that in the reference years, showing the same species dominance structure. The relative abundance (number of whales observed/hour) of gray whales in 2014/2015 increased in comparison with that observed in the reference years (2003-2008), from two to four whales on average. Distances of gray whale migration paths observed in front of the ECA maritime terminal in 2014/2015 are similar to those of the reference years and are comprised within the range of distances cited in scientific literature: - Migration takes place in a range of distances to the coast between 400 and 4,500 m, in 95% of the follow-ups. - In 2014/2015, fewer whales were observed migrating north than south. Sightings from north to south accounted for 75% all observations. - Paths to the south are farther from the coast. - Mother-calf pairs are shown to be very close to the coast, reaching 100 m from the seashore. Distances to the coast of the sightings in 2014/2015 were not statistically different with respect to the reference years, although a great variability is observed in this indicator. The values recorded in 2014/2015 and the reference years, for all directions and all types of groups, are in the range of coastal distances mentioned in scientific literature, between 100 and 4,500 m. The expected coastal distance pattern is maintained under normal conditions (no disturbances). It is observed that swimming speed in all directions (northward and southward, except for Mothers with calves to the north) in 2014/2015 are statistically similar with respect to the reference years, and their behavior is as expected, according to scientific literature. Swimming speed values, according to the type of group (alone, mother/calf, etc.), are observed to be within the ranges indicated in scientific literature, under conditions that lack disturbing agents.	The Authorized Project EM-SAR marine mammal characterization remains unchanged and applies to the Modification.

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Authorized Project	Modification
Marine Mammals populations, especially the gray whale (*Eschrichtius robustus*), had an expected behavior (according to the 2003/2006 reference values and scientific literature) during the 2014/2015 monitoring season. The species included in Standard NOM-059-5EMARNAT-2010 and the IUCN are: *Eschrichtius robustus* *Balaenoptera musculus* *Megaptera novaeangliae* *Balaenoptera physalus* *Tursiops truncatus* *Lagenorhynchus obliquidens* *Grampus griseus* *Pseudorca crassidens (not listed in IUCN)* *Orcinus orea (not listed in IUCN)* *Zalophus californianus* *Phoca vitulina* The species found in CITES (Appendix I) are: *Eschrichtius robustus* *Balaenoptero musculus* *Megaptera novaeangliae* *Balaenoptera physalus* *Tursiops truncatus*	-
Landscape	
In the Authorized Project Land Influence Area, the landscape has a Low-visual quality, derived from the intense modifications to which it has been subject to due to the installation and construction of industrial projects and their infrastructure, in addition to the fact that they are part of La Jovita Energy Center. Visual fragility has been classified as Medium, determined by the intense human activity related to creating the La Jovita Energy Center and its infrastructure construction and operation. The Energy Center infrastructure dominates the landscape and makes it leading and dominant over any other landscape factor being assessed. The landscape rating is Medium quality.	Assessment of the landscape in the Authorized Project Land Influence Area remains unchanged. In the Modification (with the information gathered during the fieldwork), the same variables and assessment form were used as in the Authorized Project. The results obtained in the Modification agree with those of the Authorized Project, which are: Visual quality is Low, derived from intense modifications to which it has been subject to by the installation and construction of industrial projects and their infrastructure, besides the fact that they are part of the La Jovita Energy Center. Visual fragility is Medium, determined by the intense human activity from the creation of the La Jovita Energy Center and its infrastructure construction and operation. The Energy Center infrastructure dominates the landscape and makes it leading and dominant over any other landscape factor being assessed. The landscape rating is Medium quality.
Socioeconomic Environment	
The ET-SAR, AI-T, Authorized Project Polygonal Area, and the Authorized Project area are located in the state of Baja California, in the municipality of Ensenada.	The ET-SAR, AI-T, Authorized Project Polygonal Area, and the Authorized Project area are located in the state of Baja California, in the municipality of Ensenada.

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Authorized Project	Modification
In the ET-SAR, there are human settlements, such as the Bajamar Golf Club and its residential area, as well as the Salsipuedes Ranch Real Estate Settlement. In the AI-T, the Authorized Project Polygonal Area, and the Authorized Project, there are no settlements or population nucleus. The closest ones are 2.6 km straight to the Northwest (the Bajamar Golf Club and its residential area), and 2.7 km straight to the South-southeast (Salsipuedes Ranch Real Estate settlement). There is no census or disaggregated population information on the human settlements already mentioned, which is why the issue is being developed at the Ensenada municipality level. - Total population in the municipality is 466,814 inhabitants, representing 14.80% the state total (3,155,070 inhabitants), which explains that in its territorial extension of 52,482,40 km^2 there is a density of 0.1 Inhabitants/km^2 (while in the whole state, density is 0.2 Inhabitants/km^2). - The ratio of men (235,130) to women (231,684) is close to almost 1:1, indicating a balance that is not easily seen in an almost-border municipality, where there is a greater probability of migration to the United States of America for work or other reasons. - In order to explain age group distribution, it is necessary to start with the population pyramid in the state of Baja California, since it shows a trend toward a decrease in births, whose tipping point in 2010 is seen in the 10-14 year-old generation (which indicates that this process takes a minimum of 10 years), since the subsequent groups visibly decreased and, in the event it continues, the pyramid could be reversed, which would expect a gradual aging of the population and the end of the so-called “demographic bonus”. - Also noteworthy is the increase in the 65 year-old and older group, which stands out from the groups below; however, it could be due to migration from the USA, as senior citizens and retirees establish their residence in the state for economic reasons (peso-dollar exchange rate favorable to them) and real estate offers. - In the municipality, 10,331 births were registered, with a distribution of 5,254 men (50.86%) and 5,074 women (49.11%), born in 2014, which continues the trend in the male/female ratio recorded in the 2010 census, while the male population is between 15 and 29 years of age, and 27.7% of the female population is between 15 and 29 years old. Citizens over 60 years of age account for 7.7% of the population; 7.5% and 8.0% of the male and female population, respectively, correspond to adults over 60 years of age.	In the ET-SAR, there are human settlements, such as the Bajamar Golf Club and its residential area, as well as the Salsipuedes Ranch Real Estate Settlement. In the AI-T, the Authorized Project Polygonal Area, the Authorized Project area and the Modification, there are no settlements or population nucleus. The closest ones are 2.6 km straight to the Northwest (the Bajamar Golf Club and its residential development) and 2.7 km straight to the South-Southeast (the Salsipuedes Ranch Real Estate Settlement). Updated demographic indicators published on the INEGI website (http://www.beta.inegi.org.mx/app/indicadores/#) and the Population Council of Baja California website (http://www.copladebc.gob.mx/publicaciones/2017 /Mensual/ Ensenada%2020l7.pdf) for the municipality of Ensenada are: - The total municipal population in 2017 was 535,361 inhabitants; 50.2% are men (268,497) and 49.8% are women (266,684). The average age is 27 and the male index is 100.61 men for every 100 women, so the ratio remains at be 1:1. - The municipality registered 10,994 births in 2016, with a distribution of 5,496 men (49.99%) and 5,494 women (49.99%). Therefore, the trend in the 1:1 male/female ratio registered in the 2010 census continues. The population density is 10.2 inhabitants/km^2 in 2017. Grouping by age ranges in the year 2017 was: Age range 0-11: 21.1% Age range 13-29: 31.9% Age range 30-64: 40.7%. Dominant range Age range 65 and over: 6.3% Economically-Active Population (PEA, for its abbreviation in Spanish) in 2015 was 383,085 people over the age of 12. The employed PEA was 96.9% and unemployed PEA was 3.1%. The Non-Economically Active Population was 44.9%. All other indicators remain unchanged. As it can be seen from the above information, the socioeconomic and PEA assessment analyzed in the Authorized Project continues to be valid.

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Authorized Project	Modification
- The municipality is practically on the border with the United States of America, thus its population registers strong migratory movements and is subject to immigration from other states and countries (as a population that could have been floating and ended up settling in the municipal territory). It should be noted that it comes very close to a generic migratory balance. - The Municipal Gross Domestic Product (GDP) per capita amounted to 3,253 pesos, which implies the GDP was estimated at around 4 billion pesos. In turn, the 2011 Strategic Economic Development Plan for the Municipality of Ensenada indicates the primary sector is the main contributor to the GDP with 18.60%, followed by commercial activity with 14.25%, while industry contributed 11.98%, and real estate activities 11.73%, the rest of production activities complete the 100% and are the ones with the lowest economic impact. - The population economic participation rate to municipal economy is greater than half the population (57.80%), where men (72.28%) predominate over women (4 3.17%). However, it is known that many of the activities carried out by women - and which have an impact on the economy - were not quantified in the 2010 census. The municipality is rated with a very low Degree of Marginalization because its Social Gap Index is 1.06177 (very low) and the Human Development Index is 0.87, whose rating is High.	
Archeology	
INAH mapped areas where Rescue activities was carried out and areas catalogued as Archeological Reserves, due to their “high archeological interest”, within the AI-T of the Authorized Project.	This condition at the Authorized Project remains unchanged and applies to the Modification.
Environmental Diagnosis	
Geopolitical location of the ET-SAR, the AI-T of the Project, the Authorized Project Polygonal Area, and the Authorized Project was performed. Characterization and assessment of the abiotic system for the ET-SAR, the AI-T of the Project, the Authorized Project Polygonal Area, and the Authorized Project were performed.	The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project geopolitical location, as well as the characterization and evaluation of the abiotic system, hydrometeorological and geophysical risks, remain unchanged. The Modification is located in the state of Baja California, in the municipality of Ensenada. The ET-SAR, the AI-T, the Authorized Project Polygonal Area, and the Authorized Project abiotic system characterization and assessment remain unchanged. The Environmental Diagnosis developed below applies to the Modification: It is located in the BSks climate type, whose normal climatology, climograph, wind and wind speed were assessed as part of the Authorized Project.

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Authorized Project	Modification
	No hurricane path has crossed (with data from 1842 to July 2018). There are no fixed or mobile sources of emissions into the atmosphere within it. There are no fixed sources of noise emission and perimeter noise within it. It is located in the physiographic province “Baja California Peninsula”, in the subprovince “Mountain Ranges of Northern Baja California”. Its geomorphology is characterized by having a massive granite nucleus of volcanic origin with a predominance of intermediate extrusive igneous rock. It is found over a surface layer of residual soil on top of volcanic rock (less than 1 m thick) formed by sands and gravels. Cliffs are sequenced in layers of extrusive volcanic rocks, including basalts and andesites. There is a discontinuous soil layer from 0 to 1.2 m deep, with an average of 0.20 m made up of organic matter, sand, and gravel in different proportions depending on the intensity of erosive factors. It is located in seismic risk Zone C, where earthquakes are less frequent and has is a terrain acceleration of <70% gravity, thus the risk is medium. There is a risk of landslides or collapses from low to null. No soil liquefaction event has been recorded. There are no Faults or Fractures. In the Modification, there are slope ranges from 0.0° to 5.0° on approximately 97% of its surface and, due to the presence of discontinuities in the terrain originating with the presence of the cliffs and the basaltic plateau that formed platforms, there are elevations ranging from 0.0 to 280 m a.s.l. in sections of less than 100 linear meters, thus the slope ranges are from 10 to 50%, with their respective level curves. There is no risk of flooding or waterlogging The soil type is Lithosol and it is characterized by a depth of less than 20 cm to rock. It has neither an organic-matter layer nor differentiated horizons. This soil type is not susceptible to erosion. Calculating Erosion, for its Scenarios is as follows: In Scenario 1, the Wind Erosion Index is 3.60 tonnes/ha/year, the Water Erosion Index is 0.63 tonnes/ha/year, and the Total Erosion Index is 4.23 tonnes/ha/year, thus Total Erosion is 19.16 tonnes/year. The Total Erosion Index is classified as light. In Scenario 2 in the Modification, and with Clearing and Grubbing activities, Wind Erosion Index is 36.35 tonnes/ha/year, Water Erosion Index is 6.37 tonnes/ha/year, and the Total Erosion Index is 42.72 tonnes/ha/year, thus the Total Erosion is 127.74 tonnes/year.

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Authorized Project	Modification
	The Total Erosion Index is classified as light. In Scenario 3 in the Modification, the areas where there is vegetation consisting of Rosette-like Coastal Scrub (2.99 ha) will be fully used for the Modification and there will be concrete slabs over them, so Wind, Water, and Total Erosion Indexes will be 0 (zero). They are located in Hydrological Region 1 “Northeast Baja California”, in Basin (1C) Tijuana River-Maneadero Creek in the “El Farito” Sub-basin. There are only intermittent surface streams, which will not be affected in any way. It is located in the area of the “Ensenada” aquifer, CONAGUA code 0211, whose water balance analysis shows a deficit of -7.148974 Mm/m^3. The Aquifer has been closed since 1965. The infiltration Scenarios are: Scenario 1, or under current natural conditions, results in an Infiltration Volume [V_{INF}] (m^3/year) = 237.0551 Scenario 2, or with presence of the Project and Clearing and Grubbing activities, the Infiltration Volume [V_{INF}] (m^3/year) = 235,2661. Scenario 3, or with presence of the Project and Clearing and Grubbing activities, the Infiltration Volume [V_{INF}] (m^3/year) = 235.2661. The difference between Scenario 1 and Scenario 3 is 1.78 m^3/year. However, it is important to remember that current rainfall capture in the Modification area does not refill the aquifer due to the existence of a saline wedge. It is located only in the “California” Floristic Province and in the “Santa María-El Descanso” Priority Land Region 10. At the cartographic level, using INEGI’s Series VI (2017), Rosette-like Coastal Scrub correspond to shrubby Secondary Type Vegetation. At the fieldwork level, they are in the Rosette-like Coastal Scrub vegetation type.
The characterization and assessment of the biotic system was performed for the ET-SAR, the AI-T of the Project, the Authorized Project Polygonal Area, and the Authorized Project area.	The characterization and assessment of the abiotic system for the ET-SAR, the AI-T of the Project, the Authorized Project Polygonal Area, and the Authorized Project remain unchanged. Section V.3 presents the Environmental Diagnosis for the biotic environment due to specific fieldwork being carried out.
Characterization and assessment of the landscape in the AI-T of the Project, the Authorized Project Polygonal Area, and the Authorized Project area were performed.	Assessment of the landscape in the Authorized Project Land Influence Area remains unchanged.

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Authorized Project	Modification
	The Landscape assessment of landscape quality for the Modification matches the Authorized Project.
Determining the Ecosystem Instantaneous Conservation Status	
Using the Conceptual Ecological Model ([MEO for its abbreviation in Spanish] the MEO and its results (determining the instantaneous conservation status), it is considered to have a critical current ecosystem conservation Status and has a high threat level. This is due to changes of an historical anthropomorphic origin, which have fragmented the ecosystem.	The results of ecological assessment remain the same and apply to the Modification.

XIV. The **REGULATED PARTY** submitted the general flora and fauna analysis for the Modification, according to the following description:

FLORA

According to the fieldwork and results obtained, a floristic diversity typical of Rosette-like Coastal Scrub (MRC, for its abbreviation in Spanish) was recorded, where both shrubby and Succulent group species predominated, such as: *Artemisia californica, Cneoridium dumosum* (little hortiga), *Euphorbia misero* (league), *Agave shawii* (agave), *Dudleya attenuata* (everlasting), *Ferocactus viridescens* (biznaga), among others, which are typical species of the Rosette-like Coastal Scrub vegetation type.

In the same way, it described that, as expected, no arboreal individuals were recorded for this vegetation type of Rosette-like Coastal Scrub, since it is characterized by species with rosette-shaped leaves, innocuous thorny shrubs, and cacti.

Within the Modification, in the Shrubby Stratum, the greatest floristic diversity was recorded with 14 species: *Eriogonum fasciculatam* (valerian), *Lotus scoparius* (deer weed), *Artemisia californica, Rhus integrifolia* (salty), *Salvia munzii* (Munz sage), among others, most of which correspond to Rosette-like Coastal Scrub (Mora and Rivera, 2016)

Within the Modification, disturbance-indicating species were recorded, such as:

- *Salsola tragus* (Russian thistle), which is catalogued as an invasive species in the Invasive Species Agreement published in the Official Journal of the Federation on December 7, 2016, and considered to be an invasive weed (CONABIO 2018; Riley 2015; https://www.invas¡veplantatlas.org/subject.html?sub=6375; https://www.conabio.gob.mx/maiezasdemexico/chenopodiaceae/salsola-tragus/fichas/ficha.htm; https://plants.usda.gov/core/prof¡le?symbol=SATR12&photoID=satrl2_001_avp.jpg)

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- *Baccharis sarothroides* (rosemary), an exotic species in salty soils.

In the Succulent group, a lesser diversity than the one recorded for the Shrubby Stratum was obtained, registering only 7 species, where the following species stood out: *Agave shawii* (agave), *Dudleya brittonii* (everlasting), *Dudleya attenuata, Ferocactus viridescens* (biznaga). The succulent species mentioned above are individuals usually found in from the coastline; they are native species and typical of the Rosette-like Coastal Scrub vegetation type.

Within the Herbaceous Stratum, there were only 2 gramineous genera (*Aristida and Bouteloua*); this is due to the fact that the fieldwork was performed in the dry season and the Herbaceous Stratum was dry or inert.

In general, and despite the fact that the Modification area is already disturbed from the construction of roads, structures, buildings, etc., together with the existence of exotic and disturbance-indicating species, it may be concluded that the floristic community has a high conservation status, due to the fact that most of the species registered are common and native to the Rosette-like Coastal Scrub vegetation type.

FAUNA

Areas impacted by anthropogenic activities often deteriorate the habitat of much of the wildlife due to changes in land use and natural vegetation. As a consequence, many species with potential distribution in the SAR, the ET-SAR, and Modification area are not present.

With respect to large mammals (felids and canids), no species were recorded, probably because these organisms are very sensitive to disturbances in their habitat and tend to travel long distances in search of satisfaction for their biological needs. It is also important to mention that the Modification is within La Jovita Energy Center, which currently has facilities in operation for the Rosarito Gas Pipeline, the combined cycle electric power plant, La Jovita, the ECA LNG Plant, and the Zeta Gas Maritime Terminal for liquefied petroleum gas (LPG) receipt and storage.

With respect to mammals registered in the Modification, presence of species such as *Sylvilagus audubonii* (Desert rabbit and Scrubland rabbit) is explained by the fact that they are considered common organisms for the assessed biological community, since they show a wide geographic distribution, in addition to being able to take advantage of changes in land use to expand their geographic distribution.

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Birds are the most abundant, diverse, well-known, and studied group of organisms to value an ecosystem's integrity, since they are present in all habitats and respond quickly to changes in trophic chains and alterations in their environment, which allow them to be excellent indicators of an ecosystem's health and condition (Tábara, 2006) and these characteristics influence the Abundance sampled in the Modification.

In the Modification, an abundance of 149 individuals, belonging to 14 families of birds, was recorded; the species *Melozone crissalis* (California scraper), *Haemorhous mexicanus* (Mexican chaffinch) and *Callipeplo californica* (California quail) are the most abundant, probably because they are permanent residents in the region.

In the Reptiles group, there is a low diversity due to the activities carried out in the Modification environment because is immersed in La Jovita Energy Center, and has constant personnel and vehicles flow, noise, etc.

XV. The **REGULATED PARTY** carried out an Environmental Impact Analysis, identifying the impacts according to the following description:

Environmental Impact Analysis
Impacts with no change in relation to the impact identified and assessed for the Authorized Project.
Impacts identified and assessed in the Modification with a greater magnitude compared to the Authorized Project.
Impacts identified and assessed in the Modification with a minor magnitude compared to the Authorized Project.
New impacts
Impacts not considered for the Modification, and that were only identified and assessed for the Authorized Project.

In this same context, the **REGULATED PARTY** indicated that the Modification considers the addition of a new measure, which was assigned a code of **MA-12**, for the Air/Noise Levels environmental component and factor.

The following tables present the mitigation measures proposed by the **REGULATED PARTY** for those impacts identified with a greater magnitude and assessed for the Modification in comparison to the Authorized Project.

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Site Preparation and Construction						
Works/Activity	**Description of the Impact of the Authorized Project**	**Environmental Component/Factor**	**Indication**	**Modification Impact Analysis**	**Mitigation Measure**	**Code**
Commissioning and Pre-Operating Tests	Prior to the Project Operation and Maintenance stage, pre-operating tests will be performed to the equipment, including operation of Thermal Oxidizers (S0-1205A/B), Natural Gas Reinforcing Compressor (C1-1602, C2-1602), High/Medium Pressure MR Refrigerant Compressor Gas Turbine (G1-3101, G2-3101). High Pressure Propane/MR Refrigerant Compressor Gas Turbine (G1-3102, G2-3102), natural gas (NG) will be used during the commissioning to carry out pre-operating tests at the LNG Plant, tank filling, line cooling, and tanker loading/unloading, as well as all the equipment required for the development of the Project, generating ongoing and/or fugitive emissions that could alter air quality.	Air/Air quality		The impact identified and assessed for the Modification is greater in magnitude than the one identified and assessed for the Authorized Project, since it increases the operation of two Thermal Oxidizers (S3-1205A/B), one Natural Gas Reinforcing Compressor (C3-1602), as well as two High Pressure Propane/MR Refrigerant Compressor Gas Turbines (G3A-3101, G3B-3101), which will increase the generation of ongoing and/or fugitive emissions that could alter air quality However, it must be considered that none of the pollutants will exceed the maximum permissible limits established in the regulations, as it may be observed in Annex IB.3, Air Quality Modeling Analysis.	Incorporate Project equipment that generates emissions into the atmosphere into the Predictive, Preventive and Corrective Maintenance Plan for machinery and equipment through the Automated Maintenance Management System that ECA selects.	MA-06
					Establish a monitoring network to analyze air quality, which includes parameters for CO, NO_2, PM_{10}, $PM_{2.5}$, and SO_2, indicate the location on a plot of points where sampling stations are located, according to the network descriptive technical log, taking into account the air quality modeling results for the Project.	MA-08
					Perform a Preventive Maintenance Program for machinery, equipment, and vehicles. During the Operation and Maintenance Stage, incorporate machinery, equipment, and vehicles into the Maintenance Plan for the Automated Maintenance Management System that ECA selects.	MA-09
					Correlate chimney emissions, resulting values from the atmospheric monitoring network, and data from ECA's meteorological station that currently operates and will continue to operate during the different stages of the Project.	MA-10

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Site Preparation and Construction						
Works/Activity	**Description of the Impact of the Authorized Project**	**Environmental Component/Factor**	**Indication**	**Modification Impact Analysis**	**Mitigation Measure**	**Code**
					During pre-operating tests, and during the Operation and Maintenance Stage, when applicable, have control technologies in place for the equipment that generates emissions into the atmosphere. For electrical power generation equipment, have ongoing measuring systems based on technology available for such purposes.	MA-11

Operation and Maintenance						
Works/Activity	**Description of the Impact of the Authorized Project**	**Environmental Component/Factor**	**Indication**	**Modification Impact Analysis**	**Mitigation Measure**	**Code**
Process unit operation	Operation of Thermal Oxidizers (S0-1205A/B), Natural Gas Reinforcing Compressor (C1-1602, C2-1602), High/Medium Pressure MR Refrigerant Compressor Gas Turbine (G1-3101, G2-3101), High Pressure Propane/MR Refrigerant Compressor Gas Turbine (G1-3102, G2-3102) will generate ongoing and/or fugitive emissions that could alter air quality.	Air/Air Quality		The impact identified and assessed for the Modification is greater in magnitude than the one identified and assessed for the Authorized Project, since there is increased operation of two Thermal Oxidizers (S3-1205A/B), one Natural Gas Reinforcing Compressor (C3-1602), as well as two High Pressure Propane/MR Refrigerant Compressor Gas Turbines (G3A-3101, G3B-3101), which will increase generation of ongoing and/or fugitive emissions that could alter air quality	Incorporate Project equipment that generates emissions into the atmosphere into the Predictive, Preventive and Corrective Maintenance Plan for machinery and equipment through the Automated Maintenance Management System that ECA selects.	
					Establish a monitoring network to analyze air quality, including parameters for CO, NO_2, PM_{10}, $PM_{2.5}$, and SO_2, indicate location in a plot of points where sampling stations are located according to the network descriptive technical log, taking into account air quality modeling results for the Project	

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Operation and Maintenance						
Works/Activity	**Description of the Impact of the Authorized Project**	**Environmental Component/Factor**	**Indication**	**Modification Impact Analysis**	**Mitigation Measure**	**Code**
				However, it must be taken into account that none of the pollutants will exceed the maximum permissible limits established in the regulations, as may be observed in Appendix NI.3. Analysis of the Air Quality Modeling.	Perform a Preventive Maintenance Program for machinery, equipment, and vehicles. During the Operation and Maintenance Stage, incorporate machinery, equipment, and vehicles into the Maintenance Plan for the Automated Maintenance Management System that ECA selects.	
					Correlate chimney emissions, resulting values from the atmospheric monitoring network, and data from ECA's meteorological station that currently operates and will continue to operate during the different stages of the Project.	
	According to the results of the Environmental Risks Study, all high risk areas for maximum events due to thermal radiation and overpressure that were analyzed and assessed are located within the limits of Project Polygonal Area. Therefore, the surrounding facilities are not expected to be affected.	Population and workers/ Safety	-	The impact identified and assessed for the Modification is greater in magnitude than the one identified and assessed for the Authorized Project, according to the results of the Environmental Risks Study. Out of the radii affected by thermal radiation and overpressure contours for High Risk areas, only two scenarios in the Pretreatment Area cross the polygonal limits of the Authorized Project by 12 m and 14 m, toward Lot 23, adjacent to the Authorized Project Polygonal Area, which has vegetation coverage.	Comply with and follow up on the measures presented in the Environmental Risks Study.	MS-01

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Operation and Maintenance						
Works/Activity	**Description of the Impact of the Authorized Project**	**Environmental Component/Factor**	**Indication**	**Modification Impact Analysis**	**Mitigation Measure**	**Code**
				It is important to mention that these thermal radiation events are part of those identified as the worst case scenario in the Environmental Risk Analysis. It is worth mentioning that in order to mitigate this impact, a wall will be built to retain the thermal radiation effects in the Pretreatment Area		

The following table shows the mitigation measures proposed by the **REGULATED PARTY** for new impacts identified and assessed in the Modification.

Operation and Maintenance						
Works/Activity	**Description of the Impact of the Authorized Project**	**Environmental Component/Factor**	**Indication**	**Modification Impact Analysis**	**Mitigation Measure**	**Code**
Wastewater generation and management	The Authorized Project DOES NOT consider the discharge and generation of process water derived from the operation of Unit 31: Refrigerant Storage and Propane and MR Refrigeration Systems (Process and Services).	Seawater/ Water Quality	-	Process water discharge will be generated from the operation of Unit 31's cooling system: Storage for Refrigeration and Propane and MR (Process and Services) Refrigeration Systems that have a increased degree of temperature during discharge up to 3°C ambient temperature.	Perform seawater quality monitoring Continue with the Monitoring Program for Wastewater Discharge into the sea for Discharges 1 and 2.	

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				Nevertheless, discharge parameters in the Permit currently held by ECA will be complied with.	

XVI. The **REGULATED PARTY** submitted the following in the Additional Information:

1. A description of the water discharges into the sea for the Authorized Project, the location of Discharge 2 that will be used for the Modification, its analysis as final effluent, and compliance with the Particular Discharge Conditions set forth in the Concession Title currently held by ECA, as well as the expected temperature in relation to the Authorized Project's Al-M Seawater Quality Baseline, by means of which it stated there will be no type of impact in the marine flora and fauna biodiversity.

2. None of the cases assessed for Discharge 2 for the Temperature parameter at the discharge point into the receiving body exceed the wastewater discharge Particular Conditions set forth in Concession Title No. 01BCA109606/01FKOC08 held by ECA.

3. The Modification Pretreatment area shall be protected by a galvanized steel wall, including a structural base and panels made of the same material. The purpose of the wall is to prevent possible dispersion of radiation and wind that eases it.

   The wall to be built will measure 5 m high by 90 m long; this will prevent radiation interference at Lot 23, adjacent to the Project Polygonal Area. Due to its size, the wall will be built with support pillars that will be firmly anchored before being erected. Considering the structural configuration of the wall, the beams will be fastened to a concrete foundation, for which approximately 90 m^3 of concrete is estimated for its construction.

   Although the wall will have characteristics similar to those of a fence (comparable to a porous border), it will not have a direct view to the interior of the Pretreatment Area; that is if the wall is observed perpendicularly. The porosity in the wall suggested above is intended to buffer circulating air; however, it does not completely limit its displacement into the interior.

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The proposed wall will be located in the Pretreatment Area intended for the Modification. The Pretreatment Area will be located within the Regasification Plant area located in the Authorized Project Polygonal Area.

4. The production capacity of the plant nursery will not be affected even with the reduction in the nursery's surface area due to the Modification, since it will be larger than the surface that the nursery currently has.

XVII. In accordance with the provisions in the Agreement[10], and with respect to what the **REGULATED PARTY** has stated, it shall carry out High Risk Activities due to the handling of Natural Gas and Liquefied Natural Gas in quantities larger than the reported quantity of **10,000 barrels** for each of the respective substances, indicated in the Second List of High Risk Activities, published in the Official Gazette of the Federation on May 4, 1992, which determines the activities to be considered high risk, based on the action or set of actions, of either natural or anthropogenic origin, associated with the handling of substances with flammable or explosive properties, in such amounts that, in case a release occurs, either due to a leakage or spillage thereof, or an explosion, it would cause significative impact to the environment, population, or their assets.

Similarly, when an activity is related to the handling of a substance that has more than one of the indicated hazardous characteristics, in quantities equal to or larger than its **report quantity**, which is defined in Article 3 of said agreement as: "*the minimum quantity of a hazardous substance in production, processing, transportation, storage, use, or final disposal, or the addition thereof, existing at a given installation or means of transportation...*", shall be considered high risk.

Therefore, according to the information submitted through the **ERA** and the **modification** to the **MIA**, the **REGULATED PARTY** intends to store a total of **6,175 million tons per year** (**MTPA**, for its abbreviation in Spanish) of Liquefied Natural Gas, which is larger than the reported amount of 10,000 barrels indicated in the Second List of High Risk Activities, considering the possibility of risk in the operation and maintenance of the Storage Terminal, obtaining the maximum probable event and maximum catastrophic event occurrence identified by means of a Preliminary Hazards Analysis to identify potential material emissions from the Modification, subsequently prioritizing the events through risk matrixes and determining the damage radii, utilizing a PHAST simulator, version 7.11.

[10] Agreement through which the Secretariat of the Interior and the Secretariat of Urban Development and Ecology issued the second list of high risk activities, published in the Official Journal of the Federation on May 4, 1992.

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The scenarios performed are described below:

- **Puddle Fires**

The following table contains a list of puddle fires in containment pits and those that are not contained. Summary of spills in containment pits and those that are not contained, which were considered for High Risk and Buffering Zones.

Subsystem	**16**	**31**	**35/36**	**37**	**31 (50-mm orifice)**
Fuel type	Natural Gas Liquids	Liquefied Natural Gas	Ethylene/Propane	Pentane	Liquefied Natural Gas
Containment Pit	IB-1	IB-Existing	IB-2	IB-3	Not contained
Substrate	Concrete	Concrete	Concrete	Concrete	Concrete
Surface Area (m^2)	16.0	163.8	10.2	25.8	31.1

Radii affected by thermal radiation for a puddle fire for the highest risk subsystems.

Subsystem	**High Risk Zone Distance at 5 kW/m^2(m)**	**Buffer Zone Distance at 1.4 kW/m^2 (m)**
16	20.0	34.7
31	73.7	129
35	16.9	29.2
36	18.6	32.0
37	23.4	40.7
31 (50-mm orifice)	28.7	49.9

- **Fire Darts in the Pretreatment Area**

With respect to the modeling to determine High Risk Zones and Thermal Radiation Buffer Zones for fire darts, the following considerations were made:

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- For emissions with high flow rates, the discharge rate was increased to 125% of the design flow, in order to estimate the maximum pump flow (runout) rate.
- The pressure is calculated from the Orifice Equation to be entered into the model to produce 125% the design mass flow through the line.
- The Orifice Equation is used in the PHAST mainly to determine/measure the flow rate of any liquid that passes through an orifice.
- In order to apply the calculation, it is necessary to estimate one of the variables within the equation, essentially that related to mass flow, pressure, or temperature

Flow and Pressure Data used in the Model for Fire Dart Calculation in Subsystems 1, 19, and 21 that Originate in the Pretreatment Area.

Subsystem	**1**	**19**	**21**
Process Area	Pretreatment	Pretreatment	Pretreatment
Component	Natural Gas	Natural Gas	Natural Gas
LFL	5.0%	5.0%	5.0%
Source Pressure (bar)	2.25	2.36	2.68
Temperature (°C)	15.7	-75.8	25.7
Leakage Diameter (mm)	660	508	610
Design Flow (kg/hr)	458,018	343,865	440,178
Maximum Flow (kg/hr)	573,000	430,000	550,000
Leakage Elevation (m)	0.5*	1.0	5.5
Emission(s) Duration	600	600	600

Radii Affected by Thermal Radiation from Fire Darts for the Highest Risk Emissions from Subsystems in the Pretreatment Area.

Subsystem	**Material**	**High Risk Zone Distance at 5 kW/m^2(m)**	**Buffer Zone Distance at 1.4 kW/m^2 (m)**
1	Natural Gas	92.9	218
19	Natural Gas	82.2	194
21	Natural Gas	85.8	211

- **Fire Darts in the Liquefaction Area**

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Summary of Data Input from the Model for Fire Dart Calculations in the Liquefaction Area.

Subsystem	23	27	29
Process Area	Liquefaction	Liquefaction	Liquefaction
Component	Liquefied Natural Gas	Refrigerant (Refrigerant Mixture)	Refrigerant (Refrigerant Mixture)
LFL	5.0%	1.6	2.4
Pressure (bar)	**0.6141**	17.96	1.001
Temperature (°C)	-155.4	20.9	14.5
Leakage Diameter (mm)	150	81.2	1,067
Design Flow (kg/hr)	220,089	316,204	970,647
Calculated Flow Rate (kg/hr)	275,000	395,000	1,210,000
Leakage Elevation (m)	6.0	5.5	5.5
Emission(s) Duration	600	600	600

Radii Affected by Thermal Radiation for the Scenarios with the Highest Risk of Fire Darts in the Liquefaction Area.

Subsystem	Material	High Risk Zone Distance at 5 kW/m^2(m)	Buffer Zone Distance at 1.4 kW/m^2 (m)
23	Liquefied Natural Gas	118	222
27	Refrigerant (Refrigerant Mixture)	106	199
29	Refrigerant (Refrigerant Mixture)	132	304

- **Fire Darts in the Plant Balance**

Summary of Model Data Input for Fire Dart Calculations for Plant Balance.

Subsystems	31	32	41
Process Area	Plant Balance	Plant Balance	Plant Balance
Component	Liquefied Natural Gas	Natural Gas	Natural Gas

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Subsystems	31	32	41
LFL	5.0%	5.0%	5.0%
Pressure (bar)	1.62	0.105	0.0237
Temperature (°C)	-155.2	-137.0	-135.7
Leakage Diameter (mm)	210	1,016	914
Design Flow (kg/hr)	440,178	86,613	99,826
Leakage Elevation (m)	1.5	3.5	1.0
Maximum Flow (kg/hr)	550,151	108,375	125,218
Emission(s) Duration	600	600	600

Radii Affected by Thermal Radiation for the Fire Dart Scenarios Analyzed in the Plant Balance.

Subsystem	Material	High Risk Zone Distance at 5 kW/m^2(m)	Buffer Zone Distance at 1.4 kW/m^2 (m)
31	Liquefied Natural Gas	168	307
32	Natural Gas	68.0	142
41	Natural Gas	71.7	149

Summary of Model Data Input for Calculating the Fire Dart of an Emission in the Liquefied Natural Gas Unloading Line.

Scenario	Unloading Line
Component	Liquefied Natural Gas
LFL	5.0%
Pressure (bar)	5.72
Temperature (°C)	-160.7
Leakage Diameter (mm)	914
Design Flow (kg/hr)	5,280,000
Leakage Elevation (m)	6
Emission(s) Duration	600

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Summary of the High Risk Zone and Buffer Zone for Fire Dart Thermal Radiation for the Highest Risk Liquefied Natural Gas Emission Scenario for the Liquefied Natural Gas Loading and Unloading Line.

Scenario	Flow Rate (kg/hr)	Orientation	High Risk Zone Distance at 5 kW/m^2 (m)	Buffer Zone Distance at 1.4 kW/m^2 (m)
Unloading line	6,600,000	Vertical	316	561

In this sense, the **PROJECT** is considered to be an activity that does not have a significant impact on the environment, as long as it is carried out in an appropriate manner and based on compliance with current federal, state, and municipal regulations for each area of impact; therefore, the **REGULATED PARTY** proposes technical operational recommendations, security systems, and prevention measures to reduce the possibility of an undesirable event mentioned in the **ERA** from occurring and, therefore, it describes the measures to be implemented to minimize the likelihood of such risk scenarios.

TECHNICAL OPERATIONAL RECOMMENDATIONS.

Recommendations	Area/Center
1. Review and update the tsunami and storm surge analysis performed for the Regasification Plant, in order to determine the need for additional mitigation (e.g., the higher elevation of the new power island equipment, confirmation of the elevation of the construction laying area).	Site
2. Confirm the flooding level that could be expected in the event of a tsunami and compare it to the elevation of critical electrical infrastructure.	Site
3. Use successfully-installed slope protection systems on site for application in the new pretreatment and burner areas.	Site
4. Confirm rainfall design groundwork for the new multipoint burner area to be used in slope design, slope protection systems, and rainwater management equipment.	Site
5. Update the site's Emergency Response Plan to reflect new medium-scale liquefaction and other facilities, and include refrigerant truck accidents, based on completed works diagrams.	Site

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Recommendations	Area/Center
6. Incorporate the results of the accidental emission dispersion modeling into the instruments for elevation, location, and monitoring selection, and air intake closuring to prevent hydrocarbon vapors ingestion in ignited equipment. The dispersion modeling must include the atmospheric PSVs from the regasification vaporizer.	General layout
7. Ensure occupied buildings are equipped with adequate protection to prevent flammable vapor ingestion in the event of a large emission.	General layout
8. Assess the fire and explosion impacts of large hydrocarbon emissions on existing equipment in authorized units, including occupied and/or critical buildings, and incorporate the findings of the analysis into the permit application plan(s).	General layout
9. Update passive fire protection requirements for existing regasification units that could be impacted by a fire originating in the new liquefaction plants, based on the flammability and explosiveness analysis.	General layout
10. Ensure the development of procedures to change the mercury absorber and H2S sequestrant bed to include the safe handling of these expended materials.	Pretreatment
11. Install the necessary safeguards to minimize the potential in order to rapidly identify leaks in the Seawater Refrigerant Mix cooler tube, and minimize potential accumulation of flammable vapors in the seawater drain; e.g., flammable gas detection and alarms.	Liquefaction
12. Ensure equipment is designed for cold prestart conditions after purging, during the next phase of the Modification.	Liquefaction
13. Assess the options to determine process and pipeline modifications, as well as mechanical and structural modifications to existing LNG tanks in order to ensure they are performed safely. Refer to the IHI tank modification study conducted for the Authorized Project.	Liquefaction

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Recommendations	Area/Center
14. Ensure adequate safety margins are incorporated for highway weight limits, and heavy-traffic road portions located over sections of existing buried pipelines, in order to consider construction and the transportation of LNG Plant equipment.	Unit operations/construction
15. Ensure leveling and civil engineering design for the heavy-traffic road piping cross-section.	Unit operations/construction
16. Develop a vehicle traffic safety plan for the Modification construction.	Unit operations/construction
17. Review the SIMOPS implications for the Authorized Liquefaction Facilities construction at the operating Regasification Plant and the updated connection points and process isolation, in order to guarantee the construction plans are developed accordingly.	Unit operations/construction
Develop location plans for temporary construction installations, based on the results of the SIMOPS construction consequences modeling, in accordance with Standard API 753.	Unit operations/construction
18. Review the SIMOPS implications for the construction of the new units at the operating Regasification Plant and ensure the connection points, process isolation, and construction plans are developed accordingly.	Unit operations/construction
20. Develop a blasting study and incorporate it into the blasting plans for the Modification construction.	Unit operations/construction
21. Install instrumentation safeguards on the LNG tanker steam return line toward the evaporation gas system in order to supplement operating procedures, with the aim of preventing C02 contamination and potential freezing and clogging of the BOG system during tanker purge at the pier.	Simultaneous import/export operations and liquefaction/regasification operation
22. Provide facilities and/or procedures to prevent contaminated rainwater pumping from the containment pit into the rainwater system.	Drainage and containment systems
23. Assess the need to have additional mitigation measures to protect equipment or structures exposed to radiant heat from fires in containment pits, based on the results of the implications analysis.	Drainage and containment systems

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SAFETY SYSTEMS

According to the results of the Environmental Risk Analysis, the Modification considers the same actions to prevent and/or handle risk events due to thermal radiation or overpressure, as established for the Authorized Project.

1. **Safety Systems**

- Flammable gas detectors and flame detectors
- Emergency shutdown system (SPDE, for its abbreviation in Spanish)
- Isolation valves
- High-expansion foam application system
- Safety locks (interlocks)

2. **Preventive Measures**

3. **Maintenance and Inspection Programs**

- Routine Maintenance/Inspection During Operation
- Maintenance Steps
- Maintenance Preparation
- Service Reinstatement

4. **Planned/Time-Based Preventive Maintenance**

5. **Legally-Regulated Maintenance**

6. **Contingency Programs**

- Emergency Response
- Emergency Depressurization System
- Overpressure Protection
- Risk Detection System
- Risk Mitigation Systems
- Firefighting System. Appendix II.10 includes the firefighting system plans for the Modification.
- Firefighting and Safety Equipment
  - Portable Fire Extinguishers
  - Personal Protection Equipment

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- Emergency Response Brigade
- Fire Prevention Plan

XVIII. This **DGGPI** considers that the **PROJECT** modification requested by the **REGULATED PARTY** refers to reconfiguring the authorized train capacity, for which a third liquefaction train with a lesser capacity will be required (3.29 MTPA) and reducing the capacity of the two authorized liquefaction trains from 6,175 MTPA to 4.53 MTPA, without this implying any effect on the contents of the authorization; therefore, it complies with the assumption provided in Article 28, Fraction II, of the Regulations for the General Law of Ecological Balance and Environmental Protection for Environmental Impact Assessment.

Based on the aforementioned, and on the grounds of Articles 1, 2, 3, Fraction XI, Item c), 4, 5, Fraction XVIII, 7, Fraction I, in the National Industrial and Environmental Safety Agency Act of the Hydrocarbons Sector; 5, Fractions X and XIV, 6, second paragraph, 2, 8, Fractions II, VII, X, and 30, third paragraph, in the General Law of Ecological Balance and Environmental Protection (**LGEEPA**); 4, Fraction XIX, 18, Fraction III, and 29, Fractions XIX and XX, in the Internal Regulations for the National Industrial and Environmental Safety Agency (ASEA) (**LGEEPA**); 4 Fraction XIX, 18, Fraction III, and 29, Fractions XIX and XX, in the Internal Regulations for the National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector; 5, item D), Fraction VII, and 28, Fraction II, in the Regulations for the General Law of Ecological Balance and Environmental Protection for Environmental Impact Assessment (**REIA**); 16, Fraction X, and 19, second paragraph, in the Federal Law of Administrative Procedure, this **DGGPI**, exercising its power, being competent to dictate this document, in accordance with the provisions in the 1st Article of the **AGREEMENT** which delegates said powers to the General Directorate of Industrial Processes Management, published in the Official Journal of the Federation, on November 30, 2017, and once the application, as well as the documentation attached thereto, have been analyzed.

RESOLVES

FIRST. This **DGGPI** determines to **AUTHORIZE** the modifications to the **PROJECT** described in Clauses IV to XVII in this resolution.

The aforementioned modifications shall be subject to both the provisions in such Clauses and the following constraining factors:

1. The **REGULATED PARTY** must submit to the **AGENCY**, 30 business days prior to the construction stage, a **Qualitative Risk Assessment based on final information from the engineering approved for construction**, in order to prove it has the necessary protection measures to maintain the risks as low as reasonably possible with the aim of ensuring that, in the event of an unwanted event, areas vulnerable to the population or adjacent facilities are not affected.

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The aforementioned so that this **DGGPI** may assess the resulting risks and, as the case may be, the consideration of new recommendations and constraining factors for the subject matter.

2. The project design must consider operating conditions (pressure, temperature, flow, and orifice size) that were taken into account to determine the radii of impact in order to ensure that, in the event of an unwanted event, vulnerable areas close to the facilities are not affected.

3. The REGULATED PARTY must have the protection systems 100% available during the plant operation and maintenance stages.

SECOND. In the event of total or partial removal of forest vegetation as a result of said modification, this resolution does not exempt the **REGULATED PARTY** from processing and obtaining the relevant authorization to change the land use for forest plots before the Industrial Management Unit of this **AGENCY**, in accordance with the provisions in Article 68, Fraction I, and 93, in the General Law for Sustainable Forest Development, and Article 12, Fraction I, Item a), in the Internal Regulations for the National Industrial and Environmental Safety Agency (ASEA) of the Hydrocarbons Sector.

THIRD. In the event the **REGULATED PARTY** intends to carry out works and/or activities in addition to those stated, these must be previously notified to this **DGGPI** in order for it to determine the appropriate environmental impact formalities, in accordance with Article 28 of the **REIA**.

FOURTH. This resolution is issued in accordance with the technical information attached to the submitted written document; in the event there is any false information therein, the **REGULATED PARTY** shall be imposed with the penalties incurred by whomever acting falsely, in accordance with the provisions in Fractions II and III, in Article 420 Quater of the Federal Criminal Code, regarding crimes against environmental management.

FIFTH. This resolution only refers to the environmental impact assessment provided for the ecosystem(s) [1] of which the **PROJECT** site and its influence area are part of, which were described in the Environmental Impact Statement under the Regional modality, and submitted in accordance with the provisions in Article 30 of the **LGGEPA**; therefore, this resolution does not constitute a permit or authorization to start works, since these are within the scope of municipal entities, in accordance with the provisions in State Political Constitutions, as well as municipal organic and urban development legislation or territorial ordinance of federal entities.

[1] Ecosystem.- Basic functional unit of living organisms interaction, with each other and with the environment, in a given space and time (Art. 3, Fraction III, in the LGEEPA)

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Likewise, this resolution **does not recognize or validate legitimate ownership and/or tenure of land**; therefore, actions determined by the **DGGPI** itself, federal, state, and municipal authorities within the scope of their respective competencies, remain protected.

In this sense, the **REGULATED PARTY** is bound to have, prior to the beginning of any activity related to the **PROJECT**, all of the permits, authorizations, licenses, among others, that are necessary for its performance, in accordance with applicable legal provisions in force related to any subject matter other than the one referred to in this resolution, with the understanding that the resolution issued by this **DGGPI** must not be considered a cause (binding) for other authorities, within the scope of their respective competencies, to grant their authorizations, permits, or licenses, among others, corresponding thereto.

SIXTH. The **REGULATED PARTY**, once the **PROJECT** enters the operation phase, must submit, within 60 business days, the Environmental Risk Study (**ERA**) for facilities in operation, formality ASEA-00-032, utilizing the **Risk Analysis Guide for the Hydrocarbons Sector** (ARSH), for this **DGGPI** to assess the resulting risks and, as the case may be, consider new recommendations and conditioning factors for the subject matter. For this purpose, it must consider, among others, the final engineering information approved for construction and the “as-built” plans for the installation. Likewise, it must utilize a systematic and methodological process to identify hazards and assess risks, which allows to accurately establish selected risk scenarios to simulate consequences and verify the existence of safety systems and preventive measures or, where applicable, propose the necessary actions to prevent, control, and mitigate identified risk scenarios; the foregoing, to achieve the PROJECT risks reduction and management. Additionally, and based on the results of the **ERA**, it must submit its Accident Prevention Program, formality **ASEA-00-030**, which must be consistent with the risk scenarios derived from the **ERA**, and include, among others, pertinent actions aimed at risk management and reduction, safety systems, preventive measures, an emergency response plan, and personnel trained to handle emergencies in the event the risk scenarios identified in the **ERA** occur.

It is not omitted to mention that noncompliance with the Terms and Conditions shall cause the **REGULATED PARTY** to have an administrative liability inherent to the acts of authority with respect to the powers and competence of this **AGENCY**.

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SEVENTH. It is important to mention that the **REGULATED PARTY** must have the authorization of the Industrial Safety, Second Operating, and Environmental Protection Management System (**SASISOPA**) prior to the development of any activity, with the aim of preventing, controlling, and improving performance of the facilities or set of facilities in Industrial Safety, Operational Safety, and Environmental Protection, with the application of national and international standards and best practices. Therefore, based on the aforementioned, it is stipulated that, according to the activity of the hydrocarbons sector that it intends to develop, it must comply with the Mexican Official Standards in force.

For such authorization, the hazards identification and risks analysis shall be presented in the document based on the Engineering approved for construction and “as-built” plans.

EIGHTH. The modification granted by this **DGGPI** shall be subject to the Terms and other Conditions set forth in resolution **ASEA/UGI/DGGPI/0233/2017**, dated November 30, 2017, as well as the other official documents issued in relation to the **PROJECT**; this modification shall become effective for all relevant purposes.

NINTH. Inform the **REGULATED PARTY** that, in accordance with the provisions in Articles 161 of the General Law of Ecological Balance and Environmental Protection, 2 and SS of the Regulations for the General Law of Ecological Balance and Environmental Protection for Environmental Impact Assessment, and 5, Fraction VIII, in the National Industrial and Environmental Safety Agency Act of the Hydrocarbons Sector, this **AGENCY** may perform inspection, monitoring, and, where appropriate, imposition of penalties for violations of the relevant provisions and act accordingly, as per Chapters III and IV in the Sixth Title of the **LGEEPA**, and IX of the **REIA**.

TENTH. The **REGULATED PARTY** is informed that this resolution issued due to the application of the General Law of Ecological Balance and Environmental Protection, its Regulations on Environmental Impact Assessment, and the others provided in other legal and regulatory provisions on the matter, may be challenged, through an appeal for review within a term of fifteen business days from the day following notification of this resolution, pursuant to the provisions in Article 176 of the General Law of Ecological Balance and Environmental Protection.

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ELEVENTH. It is ordered that this resolution is notified personally, in accordance with Article 167 Bis 1 of the General Law of Ecological Balance and Environmental Protection, to C. MARÍA CRISTINA KESSEL ENRÍQUEZ, in her capacity as Legal Representative for the company **ENERGÍA COSTA AZUL, S. DE R.L. DE C.V.**; likewise, **C. WILLIAM GURROLA WESTFALL, SERGIO ROMERO OROZCO, SANTIAGO A. RANDA ÁVALOS, JORGE URIBE VILLALOBOS, ALEJANDRO RÍOS RIPPA, MARIO CHRISTIAN LÓPEZ HERNÁNDEZ, ALEJANDRO JOSÉ QUINTERO MEZA, EDGAR MONDRAGÓN MORENO, RENÉ ENRÍQUEZ GÓMEZ, LORENA EGUÍA LIS, BLANCA ELIZABETH MENDOZA RAMÍREZ, IRINEO FLORES AGUILAR, FRANCISCO JAVIER ARROYO HERNÁNDEZ, ALVARO PINTO FAJER, MARIO DE AGÜERO VILLACORTA AND VIRIDIANA CASTAÑÓN SÁNCHEZ** are herein considered to be authorized to hear and receive notifications, in accordance with the provisions in Article 19 of the Federal Law of Administrative Procedure.

SINCERELY,
THE GENERAL DIRECTOR

ENG. DAVID RIVERA BELLO

For a responsible use of paper, copies of acknowledgement of this subject are sent via electronic mail

c.c. **Eng. Carlos de Regules Ruiz-Funes. ASEA Executive Director.** Acknowledgement, direccion.ejecutiva@asea.gob.mx
Mr. Ulises Cardona Torres. Head of the Industrial Management Unit. Acknowledgement. ulises.cardona@asea.gob.mx
Eng. David Hernández Martínez. Transportation and Storage Supervision, Inspection and Surveillance General Director. david.hernandez@asea.gob.mx

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RESOLUTION OF THE ENERGY REGULATORY COMMISSION THAT MODIFIES NATURAL GAS LIQUEFACTION PERMIT G/20709/LICUE/2017, GRANTED TO ENERGÍA COSTA AZUL, S. DE R.L. DE C.V., WITH REFERENCE TO THE GENERAL DESCRIPTION, EQUIPMENT, CAPACITY AND INVESTMENT OF THE LIQUEFACTION SYSTEM

THEREFORE

FIRST. That, on June 17, 2015, the National Industrial and Environmental Safety Agency for the Hydrocarbons Sector (ASEA) issued Agreement ASEA-CRT-001/2015, which determines the criteria for operational safety of facilities and equipment, for the authorities responsible to grant the permits referred to in Chapter I of the Third Title in the Hydrocarbons Law (LH, for its abbreviation in Spanish) to assess compliance with Article 51, fraction I, of such Law (the ASEA Agreement).

SECOND. That, through Resolution RES/2912/2017 dated December 18, 2017 (the Resolution), the Energy Regulatory Commission (the Commission) granted Energía Costa Azul, S. de R.L. de C.V. (the Permittee) natural gas liquefaction permit G/20709/LICUE/2017 (the Permit).

THIRD. That, the Permit considers, in a general manner, the regulation and measurement station and two liquefaction trains with 38,467 m^3/day each (6,175 mtpa), with a total system capacity of 76,934 m^3/day (12,35 mtpa). Such facilities are scheduled to begin construction on December 31, 2020, and begin operations on December 31, 2026.

FOURTH. That, by means of an official document received by the Commission on August 7, 2018, the Permittee submitted an application to modify the Permit, the purpose of which is to modify the general description, equipment, and capacity of the liquefaction system (the Application), which was admitted for processing on August 21, 2018 by means of official document SE-300/72722/2018.

FIFTH. That, by means of official document UGN-250/95381/2018 dated October 1, 2018, the Commission requested the Permittee to submit diverse information and documentation related to the Application. Stated official document was handled by means of a written document submitted to the Commission on October 25, 2018.

WHEREAS

FIRST. That, in accordance with Articles 22, fractions I, III and X, and 42 of the Law of Coordinated Regulatory Bodies for Energy Matters (LORCME); 48, fraction II and 81, fraction I, item d) of the LH and 5, fraction IV and 48 of the Regulations for activities referred to in the Third Title of the Hydrocarbons Law (the Regulations), the Commission has the power, among other duties, to regulate natural gas liquefaction activities, as well as to grant permits in order to carry out such activities.

SECOND. That, in compliance with Article 48 of the Regulations, the Applicant made a payment for use of the analysis, assessment of the Application and, when applicable, modification of the respective permit certificate, in terms of the provisions in official document No. 349-B-210, issued by the Non-Fiscal Revenue Policy Unit of the Assistant Secretariat of Revenue for the Secretariat of the Treasury and Public Credit, dated February 23, 2017, and the eighth paragraph in Article 10 of the Federal Revenue Law for Fiscal Year 2018, which establishes that, as long as uses for fiscal year 2018 are not authorized, those in effect up to December 31, 2017, multiplied by the corresponding factor, shall apply.

THIRD. That, from the analysis and assessment of the information submitted by the Permittee and in accordance with provision 4.3, fractions I and IV of the Permit, the subject of the Application is limited to: i) the integration of a regulation and measurement station and a liquefaction train with a design capacity of 21,082 m^3/day (3.29 mtpa), the modification of the capacity of the two liquefaction trains permitted to be 28,336 m^3/day (4.53 mtpa) each; ii) general description; iii) technical specifications, and iv) investment, for which it is pertinent to modify the Permit that corresponds to Attachment 1, *Description, Location, and Liquefaction System Capacity*; Attachment 3, *Technical Specifications for the Natural Gas Liquefaction System*, and Attachment 5, *Investment and Financing Sources*.

FOURTH. That the information submitted as part of the Application establishes that the Project covered by the Permit will be developed in two stages. In the First Stage, a liquefaction train to produce LNG is considered, with a design capacity to liquefy 21,082m^3/day (3.29 mtpa); while in the Second Stage, two additional trains to liquefy LNG are considered, with a design capacity to liquefy 28,336 m^3/day each (4.53 mtpa), which is equivalent to a total of 77,754 m^3/day (12.35 mtpa) for the System.

FIFTH. That as seen in the Application the estimated date for the start of construction of the Liquefaction System is December 31, 2020, while the estimated date for the first train to come into operation is September 30, 2024, the second train on December 31, 2029 and the third train on September 30, 2030.

SIXTH. Since the Application satisfies the requirements referred to in Articles 50, 51, and 121 of the LH, and 44 and 48 of the Regulations, as well as the requirements set forth in Resolution RES/577/2015, which establishes the requirements for submitting applications to obtain permits for transportation, storage, distribution, liquefaction, regasification, compression, decompression, retailing to the public, and integrated natural gas systems management, as indicated in the documents and assessments contained in the Commission files; therefore, it is admissible to modify the Permit in accordance with the provisions in the previous Third whereas clause.

SEVENTH. That the ASEA has not yet made public the list of third party specialists necessary to fully comply with Paragraph B in ASEA-CRT-001/2015 Agreement and, consequently, fraction I of Article 51 of the LH.

EIGHTH. That, since industrial safety and operational safety at hydrocarbon sector facilities exclusively correspond to the ASEA, in accordance with Article 1, fraction I in the Law of the National Agency on Industrial and Environmental Safety for the Hydrocarbons Sector (ASEA), the modification of the Permit shall not imply approval of safety conditions of the equipment intended for providing services, since this is not within the powers of the Commission.

Due to the aforementioned, and based on Articles 2, fraction III and 43 Ter of the Organic Law of the Federal Public Administration; 1, 2, fraction II, 3, 4, first paragraph, 5, 22, fractions I, II, III, X, XXIV and XXVII, 27, 34, and 42 of the Law of Coordinated Regulatory Bodies for Energy Matters; 1, 2, fraction III, 5, second paragraph, 48, fraction II, 50, 51, 81, fractions I, item d), 95, 121 and 131 in the Hydrocarbons Law; 35, fraction II, and 57, fraction I, in the Federal Law of Administrative Procedure, 1, 3, 5, fraction IV, 6, 7, 25, 44, 45 and 48 in the Regulations for the activities referred to in the Third Title of the Hydrocarbons Law, and 1, 4, 7, fraction I, 12, 16, 18, fractions I and III in the Internal Regulations of the Energy Regulatory Commission:

RESOLVES

FIRST. Natural gas liquefaction permit G/20709/LICUE/2017 granted to Energía Costa Azul, S. de R.L. de C.V. is modified by means of Resolution RES/2912/2017, in its Attachments 1, 3, and 5, in accordance with the provisions in the Third Whereas Clause. Such attachments form an integral part of this resolution as a single attachment.

SECOND. The modification to natural gas liquefaction permit G/20709/LICUE/2017, in the terms referred to in the First Resolution Clause, is without prejudice to the other authorizations and permits that Energía Costa Azul, S. de R.L. de C.V. must obtain from other federal or local authorities.

THIRD. The modification to natural gas liquefaction permit G/20709/LICUE/2017 does not imply in any way the modification to the other conditions therein, thus they will remain in force. Including what is referred to in the Third resolution clause of RES/2912/2017 regarding accreditation for exercising Permit rights

FOURTH. Energía Costa Azul, S. de R.L. de C.V. must submit the information required in provision 5.2 of the permit certificate to the Energy Regulatory Commission. Such information and documentation must be submitted for each liquefaction train, within the terms set forth in the same provision 5.2 of the Permit.

FIFTH. Before the liquefaction system construction start date, Energía Costa Azul, S. de R.L. de C.V. must submit to the Energy Regulatory Commission, the information and documentation related to the regulatory listing and design of the facilities and equipment, duly supported by a third party specialist, in order to accredit compliance with Article 51 of the Hydrocarbons Law, as established in Section B of the ASEA Agreement referred to in the Fifth statement clause. Such information and documentation must correspond to the facilities and equipment covered by the permit referred to in the First resolution clause, by reason of the design update carried out during the procedure.

SIXTH. The Head of the Natural Gas Unit of the Energy Regulatory Commission is entrusted, in accordance with Article 33, fraction XXXVIII of the Internal Regulations of the Energy Regulatory Commission, published in the Official Gazette of the Federation on April 28, 2017, to carry out the modification to natural gas liquefaction permit G/20709/LICUE/2017 referred to in the First resolution clause, as well as to integrate thereinto the information and documentation that Energía Costa Azul, S. de R.L. de C.V. submits in compliance with the Fifth resolution clause within the terms set forth, and it instructs the Executive Secretary to notify this resolution by means of the Electronic Filing Office.

SEVENTH. It is ordered that notice of this Resolution be given to Energía Costa Azul, S. de R.L. de C.V., and that they be advised that this administrative act may only be challenged through indirect amparo proceedings, in accordance with the provisions of Article 27 of the Law of Coordinated Regulatory Bodies for Energy Matters and that the respective file is kept and may be consulted at the Energy Regulatory Commission offices, located at Boulevard Adolfo López Mateos 172, Colonia Merced Gómez, Benito Juárez, postal code 03930, Ciudad de México (Mexico City).

EIGHTH. It is ordered that the National Industrial and Environmental Safety Agency for the Hydrocarbons Sector (ASEA) is informed on this resolution, as well as the modification to natural gas liquefaction permit G/20709/LICUE/2017, for all legal purposes.

NINTH. It is ordered that this resolution be registered under number **RES/2768/2018**, as well as the modification to natural gas decompression permit G/20709/LICUE/2017, in terms of the single attachment to this resolution, in the registry referred to in Articles 22, fraction XXVI, and 25, fractions VII and X, of the Law of Coordinated Regulatory Bodies for Energy Matters, and 4 and 16 of the Internal Regulations of the Energy Regulatory Commission.

Mexico City, December 13, 2018

Guillermo Ignacio García Alcocer
Chairman

ABSENT

Marcelino Madrigal Martínez
Commissioner

Neus Peniche Sala
Commissioner

Luis Guillermo Pineda Bernal
Commissioner

Cecilia Montserrat Ramiro Ximénez
Commissioner

Jesús Serrano Landeros
Commissioner

Guillermo Zúñiga Martínez
Commissioner

Digitally signed by INGRID GALLO MONTERO
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Reason: SE-300/9618/2019
Location: Energy Regulatory Commission

Ingrid Gallo Montero
Executive Secretary

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ATTACHMENT 1

LIQUEFACTION SYSTEM DESCRIPTION, LOCATION, AND CAPACITY

1.1 Liquefaction System Description

The project consists of the operation of a Natural Gas Liquefaction System located in the municipality of Ensenada, Baja California, in order to supply liquefied natural gas (LNG) to tankers and semitrailers.

The System has two stages. In general, the First Stage has a liquefaction train and a regulation and measurement station, while the Second Stage has two liquefaction trains and a regulation and measurement station.

Gas is delivered to the First Stage liquefaction train's Regulation and Measurement Station (ERM) through the interconnection at coordinates 31°59'22.23" North latitude, 116°50'44.11" West longitude, of the natural gas pipeline transportation system owned by the permittee, Gasoducto de Aguaprieta, S. de R.L. de C.V., with transport permit G/100/TRA/2000 (Rosarito Gas Pipeline).

Gas is delivered to the Second Stage liquefaction trains' Regulation and Measurement Station (ERM) through the interconnection at coordinates 31°59'34.60" North latitude, 116°50'39.96" West longitude, of the Rosarito Gas Pipeline.

At the ERM exit, there is a pipe that transports Natural Gas to the liquefaction trains, which are equipped to progressively cool Natural Gas with mixed refrigerants, until natural gas changes from a gaseous state to a liquid state.

After gas has passed to a liquid state, a stainless steel pipe shall carry LNG to the storage system under permit G/140/ALM/2003, which is held by the same Permittee. The Liquefaction System will transfer LNG to the storage system, through a gas pipeline that connects to Coriolis-type flow meters.

1.2 Liquefaction System Location

i. Address:

Carretera (Highway) Tijuana Ensenada km. 81.2, Ensenada Baja California

ii. System Commissioning Coordinates:

First Stage

31°59'22.23" North latitude
116°50'44.11" West longitude

Second Stage

31°59'34.60" North latitude
116°50'39.96" West longitude

1.3 Capacity

The First Stage will consider a liquefaction train to produce LNG, with a design capacity to produce 21,082 m^3/day (3.29 mtpa). The Second Stage facility will have two trains to produce LNG in addition to the one placed in the First Stage, each one with a design capacity to produce 28,336 m^3/day (4.53 mtpa), which is equivalent to a total of 77,754 m^3/day (12.35 mtpa). Production is calculated at average environmental conditions and average gas composition.

ATTACHMENT 3

NATURAL GAS LIQUEFACTION SYSTEM TECHNICAL SPECIFICATIONS

3.1 General Plan for the Liquefaction System

3.2 Measurement

3.2.1 Regulation and Measurement Stations (ERM)

ERMs involve three measurement trains; one of them will serve as a calibration or replacement measurement train. Each measurement train shall consist of a manual inlet valve and a pneumatic outlet valve, with the manual valve being used to divert the flow to the main train. Their features are as follows:

Feature	ERM Inlet
Design pressure [barg]	102
Maximum operating temperature [°C]	50
Flow [MMcfd]	1,983

3.2.2 Interconnections to the storage system

In the first stage, gas is received from the storage system in the fuel gas receipt flange. The interconnection and an ultrasonic flow meter will be located at the inlet of a fuel gas compressor that feeds natural gas into the First Stage liquefaction process. A Daniel gas chromatograph, by Emerson, is used to obtain the natural gas composition at a real-time frequency of four minutes.

Meter coordinates are 31°59”19.83”N; 116°50'54.09”O

In the second stage, the interconnection and metering will occur in the LNG head that connects to the storage tanks. This interconnection will have three Coriolis-type meters and an LNG chromatograph to obtain natural gas composition at four-minute intervals.

Meter coordinates are 31°59'16.51"N; 116°50'46.48"W

3.3 Liquefaction Trains

The liquefaction trains, in the first instance, will treat the natural gas feed to remove heavy hydrocarbons, remove impurities and condensates, in order to achieve efficient operation of the liquefaction process. Gas treatment includes equipment to remove carbon dioxide, hydrogen sulfide, water, and mercury.

The First Stage will use a fractionation tower to separate the heaviest hydrocarbons, such as pentanes and other heavier ones (C5+), while the Second Stage will use three fractionation towers. The flow of C5+ will be mixed in the high-pressure fuel gas for generating electricity, or may be sent to thermal oxidizers.

The components of the liquefaction train are listed below, which will be identical on both trains.

3.3.1 Mercury and acid gas inlet and removal facilities

Natural Gas enters the liquefaction trains at the mercury inlet and removal facilities, which are composed of the following components:

1) Inlet Gas Coalescent Filters: These will remove water and liquid hydrocarbons, which enter the liquefaction trains

2) Inlet Gas Preheater: It will use thermal oil to heat natural gas and maintain the required temperature

3) Mercury absorbers: They both remove traces of mercury to prevent equipment corrosion and minimize the release of mercury into the atmosphere.

Mercury Absorbers	
Configuration	Vertical
Design Pressure (KPag)	5,650
Design temperature (°C)	-29/80

Subsequently, natural gas coming from the mercury removal facilities flows to the acid gas removal facilities, where carbon dioxide (CO_2) and hydrogen sulfide (H2S) are separated to prevent CO_2 from clogging due to freezing in the cryogenic units and to meet LNG H2S specifications. The following equipment composes these facilities:

1) Acid Gas Absorber: This equipment absorbs the CO_2 and H_2S needed to meet the required specifications, along with a fraction of other sulfur-containing components such as COS and mercaptans.

2) Amine Regenerator: Acid gases are removed from the amine rich solution, producing a weak amine solution.

3.3.2 Dehydration

Natural Gas coming from the facilities mentioned in the previous numeral will be saturated with water, thus the Natural Gas water content must be reduced to less than 0.1 ppmv to avoid freezing in the cryogenic equipment. The facilities are:

1) Liquid Separation Tank for the Gas Dryer Feed: It separates free condensed water, which then flows into the Recovered Water Tank under level control.

2) Molecular Sieve Dryers: These adsorb the water contained in natural gas. Such dryers will be regenerated, one at a time, through an open circuit regeneration system using dry feed natural gas during this regeneration.

Molecular Sieve Dryers	
Configuration	Vertical
Design Pressure (KPag)	6,050
Design temperature (°C)	-29/350

3.3.3 Recovery and Fractioning of Natural Gas Liquids

Its purpose is to reduce the content of heavy hydrocarbons (C5+) in dry Natural Gas to less than 500 ppmv (0.05 mol%) and benzene to less than 1 ppmv, in order to avoid freezing in piping and cryogenic equipment.

For the First Stage liquefaction train, the recovery and fractioning unit also recovers natural gas liquids from the natural gas feed and separates C5+ residual condensate (to be used as fuel gas), consisting of the following sections:

1. The LNG Recovery section consists of a Natural Gas Recompressor/Expander system and a Demethanizing Tower.

2. The fractioning section consists of a Debutanizing Tower.

3. The Reinforcing Compressor section consists of a Natural Gas Reinforcing Compressor (pressure increaser) and a Post-Cooler for the Natural Gas Reinforcing Compressor

For the Second Stage liquefaction trains, in addition to reducing the heavy hydrocarbons content, Natural Gas liquids will also be recovered, which will then be fractionated to C2 and C3 (to be used as refrigerant replacement) and C5+ residual condensate (to be used as fuel gas).

1) Recovery equipment for natural gas liquids: Turbo Expander/Recompressor and a Demethanizing Tower.

2) Fractioning equipment: De-ethanizer Tower, De-propanizer Tower and De-butanizer Tower

3) The Reinforcing Compressor section consists of a Reinforcing Compressor (pressure booster) for the natural gas feed and a Reinforcing Compressor Post-cooler

3.3.4 Liquefaction and Refrigeration

The first train will use an MR Refrigeration system, the refrigeration for the Main Cryogenic Heat Exchanger (MCHE) and the Cold MCHE will be carried out by means of the Warm MR and Cold MR systems, respectively Each system shall be a closed circuit consisting of compressors, post-coolers and/or condensers. The Warm Mix of Refrigerants (WMR) shall include: nitrogen, methane, ethane, or ethylene and propane. The composition of each MR will be optimized to provide the desired thermodynamic efficiency in both MCHE.

For the Second Stage trains, a refrigeration process with propane refrigerant and MR will be used. The APCI C3MR process will use propane for the pre-cooling and mixed refrigerants for the natural gas liquefaction. The refrigeration system shall consist of two independent closed circuits: the propane refrigerant circuit and the MR refrigerant circuit.

In general, the propane refrigerant will supply initial refrigeration demand up to approximately -34°C, which will include the natural gas precooling feed and the MR refrigerant, as well as refrigeration for other process users. The MR refrigerant will provide the final cooling up to approximately -160°C, depending on the composition, and provide most of the cooling required to cool and condense the natural gas feed and the MR itself. The MR composition will be optimized to adjust to the cooling feed characteristics and obtain high thermodynamic efficiency.

Main components in this unit are:
MR Compressors - LP, MP, and HP, Low/Medium Pressure MR Gas Turbine Compressors, MR Suction Tanks, MR Coolers, MR Separator, Propane Compressor, Propane/High-Pressure MR Gas Turbine Compressors, Propane Suction Tanks, Propane Desuperheater, Propane Condenser, Propane Retrieving Condenser, Propane Retriever, Propane Accumulator, and Propane Subcooler.

3.3.5 Last Expansion Gas and Fuel Gas

In these facilities, the lightweight inert components of the LNG product are expanded. The separated liquid stream will flow to the LNG storage tanks referred to in Attachment 1 and the last-expansion gas will be compressed for use as a high-pressure fuel gas. The purpose of this system will be to supply fuel gas to the high/medium-pressure MR refrigerant gas turbine compressors, high-pressure propane/MR refrigerant gas turbine compressors, and low-pressure fuel gas system.

3.3.6 Postprocessing

Liquid gas is sent to a liquid separation tank, where LNG produced from both liquefaction trains is sent through a common pipe to the LNG storage tank referred to in Attachment 1.

3.4 Regulations Proposed by the Permittee

Adherence will be carried out to the list of national and international codes, guidelines and standards, that pertain to: process, design, civil works, environmental, and telecommunications engineering, for LNG/Propane/Propane & Butane Tanks, incinerators, burners, rotary equipment, among others.

ATTACHMENT 5

INVESTMENT AND FINANCING SOURCES

5.1 Estimated investment

Type of investment (Item)	Brief description	Amount in pesos ($)
Construction	New infrastructure, on-site preparation, and insurance	133,224,045,154
Others	Financing capitalization costs and preconstruction development	27,904,479,373
	Total fixed assets investments	**161,128,524,527**

5.2 Financing Source

The financing sources will be a combination of Own Capital and Debt contracted with Commercial and Development Banks. As a project under development, it is not possible to determine the proportion of each financing source at this stage.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled in this proceeding.

Dated this 13th day of February 2019.

/s/ Brett A. Snyder

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