The Initial Responses to the Comments on the Draft CEE for the Construction and Operation of the Turkish Antarctic Research Station (TARS) at Horseshoe Island, Antarctica

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**An information paper submitted by Turkey**

Background

A draft Comprehensive Environmental Evaluation (CEE) has been prepared by the Ministry of Environment and Urbanization (MoEU), the Scientific and Technological Research Council of Turkey (TUBITAK) Marmara Research Centre (MAM) Polar Research Institute (PRI), and Istanbul Technical University (ITU) for the proposed construction and operation of Turkish Antarctic Research Station at Horseshoe Island, Antarctica. The draft CEE has been prepared in accordance with applicable provisions of Annex I, Article 3 of the Protocol on Environmental Protection to the Antarctic Treaty and the Guidelines for Environmental Impact Assessment in Antarctica (2016).

Turkey notified the CEP Chair of the availability of the draft CEE for ‘Construction and Operation of Turkish Antarctic Research Station (TARS) at Horseshoe Island, Antarctica’ on 13 February 2021. Considering the procedures for intersessional consideration of Draft CEEs (CEP XX Final Report, Appendix 3), CEP Chair issued CEP Circular 6 / CEP XXIII on 15 February 2021 advising CEP contact points of the availability of the draft CEE; stated the need to establish an open-ended intersessional contact group (ICG) to review the draft CEE report; proposed that Australia’s CEP representative, Mr Ewan McIvor, convene the ICG. The CEE report was available in English for download from <http://lodos.mam.gov.tr/kare/Draft_CEE_of_TARS.pdf> and via the CEP Workspace on the Secretariat of the Antarctic Treaty website: <https://www.ats.aq/devAS/EP/CEPWorkspace>.

The Republic of Turkey appreciates the valuable comments made by the parties and would like to provide the initial responses to the comments from ICG participants for consideration in the CEP. Comments raised by the ICG process, and any additional comments made during discussions at CEP XXIII, will be addressed in the final CEE.

Initial Responses to the comments from ICG participants

Non-Technical Summary

The ICG participants noted that the Non-Technical Summary (NTS) could be expanded to include figures and maps, and as well as the summaries of the purpose of the proposed activity, initial environmental state, scientific research to be conducted in the station, key alternatives, spatial extent of the activities, nature and significance of associated environmental impacts. NTS of the final report will be enhanced with regional maps and visuals of the station, and it will be updated to include further details on mentioned topics.

Description of the Proposed Activity

Description of the proposed activity section of the final CEE report will be expanded comprehensively considering the comments and recommendations of ICG participants. Responses to the specific topics in the ICG report is as follows:

Scientific Activities Supported by the Station

The participants inquired about the research activities which will be supported by the proposed station and how these activities would benefit from the presence of the station. Initially, establishing a research station fully equipped with adequate infrastructural facilities will provide opportunities to conduct long-term research cost-effectively. For instance, a small research boat in the hangar, an aquarium room with marine water supply, and a divers’ room in the main building will enable measurements of physical and chemical parameters and ecosystem/biodiversity studies in Marguerite Bay. The planned station will include five laboratories namely, chemistry, biology, geotechnical, pre-process, and a cold laboratory for ice core samples. These laboratories will not only enable researchers to obtain preliminary results but also reduce the logistics and costs to transfer the samples to Turkey. The station will also include an observatory room for conducting atmospheric and astronomical observations. Apart from these, future studies will benefit from the proximity of Horseshoe Island to Antarctic mainland. Further information on the scientific capacity and research to be conducted at the proposed station will be presented in the final report.

Scientific and Logistic Collaborations

Some participants noted that the information on the potential joint logistic activities aiming to reduce costs and carbon footprint would contribute to the report. Turkey gives utmost importance to collaboration with other countries in Antarctica. In this regard, a number of bilateral agreements have been signed with countries including Belarus, Bulgaria, Czechia, Ukraine and the Republic of Korea, and scientists from other countries are hosted in the national expeditions. Therefore, it is emphasized that the proposed research station will be of benefit to scientists from all over the world. The details of these agreements will be presented in the relevant sections of the final report.

Construction Camp

Several comments were raised on the location, design, construction, operation and removal of the temporary camp to support the construction of the station. An execution plan has been prepared which includes plans and procedures for the construction camp and construction site. The construction camp will be established with 40 modules of 20 feet containers in the location determined. There will be no excavation activities for placing the modules since the containers will be placed onto ready-made platforms after ground levelling. As soon as the construction camp is established, wastewater treatment and desalination units for providing domestic water needs will be put into operation to minimise environmental impacts. The details of the construction camp will be included in the final report.

Planning and Schedule of Construction

Some comments stated that the addition of further details on the schedule and duration of specific construction works would be beneficial, and also recommended to evaluate the possibility of extending the construction into another year. The execution plan mentioned above includes the details of the construction phase, specifically work packages, estimated schedule and durations. Based on the comments noting that two years of construction period being ambitious, an alternative plan for 3 years is also studied for any unforeseen conditions. Both scenarios will be included in the final report.

Construction and Operation Logistics

Participants suggested adding further information to the final report about logistical support activities for the construction and operation. Details of construction and logistic operations are also included in the aforementioned execution plan, and the required details and updates will be presented in the final report. In summary, barges will be used for the transfer of construction equipment from the cargo ship to the site. A wharf is not planned to be built to limit the environmental impacts of the planned research station. Helicopters are not planned to be used in the construction and/or operation phases. However, a helipad is going to be built at the beginning of the construction phase to be used in case of any emergencies like medical evacuation. Only two terrestrial vehicles are planned to be used during the operation phase serving for material supply and maintenance of the research station, and also for scientific purposes when required.

Earthworks and Geotechnical Studies

Several participants raised comments on the extent and size of the earthworks along with the geotechnical surveys on the proposed construction site. Some excavation work will be carried out to install the precast foundations; however, this work will be limited to the number of foundations. Excavated material will be used for levelling of paths and laydown areas, which will further be used during construction and operation phases. Geological and geotechnical surveys were carried out in the former scientific expeditions. Natural unit weight and point load strength analyses were performed on the collected samples from the proposed construction site, and bearing capacities and subgrade reaction modulus values were calculated. Considering these calculations, the usage and technical details of precast foundations have been determined. Single footings with special geometries will be used under the frost-effect depth in order to prevent uplift problems together with the freeze-thaw effect that may occur due to climatic conditions. Details of geotechnical studies, dimensions and numbers of precast foundations, and the estimated amount of excavated material are going to be included in the final report.

Construction Materials

ICG participants noted that it would be useful if the final report would involve the specific building materials and information on their environmental performance. A list of building materials and their environmental performance will be presented within the final report to be prepared.

Energy Management

Some comments from the participants requested further information on energy management system and renewable energy sources. In summary, four diesel generators with 400 kVA power are planned to be installed in the Energy Centre which is close to the fuel tanks. Installation of wind turbines is cancelled based on the remarks received on the draft CEE due to limited information on migration routes of birds. Necessary observations and scientific studies will be conducted to obtain more information on the aforementioned issue after the proposed research station is established. Then, the use of wind turbines will be re-considered for decreasing fossil fuel consumption. Environmental impact assessment for installing wind turbines will be prepared if the conditions allow based on the observations. Details about the Energy Management System with the construction, operation and contribution of renewable energy sources will be included in the final report.

Specific details of the fuel tanks and containment infrastructure were discussed by the ICG participants. According to the calculations, 20 tanks with a capacity of 40 tonnes will adequately support the research station’s energy requirements for two years considering possible failures in supply. Only Antarctic Diesel will be used in the generators and vehicles of the proposed station. Fuel tanks will be designed to prevent possible leakages and spills. Technical sketches and specifications of the tanks will be included in the final report.

Waste Management

Detailed information about the wastewater treatment and the discharge location was requested by some ICG participants. As stated in the draft CEE report wastewater will be treated biologically. Greywater will also be treated and reused for flushing toilets and cleaning purposes in order to save water. Treated water will be discharged at sea from a point where conditions for dilution and rapid dispersal are met as stated in Article 5 of Annex III. Technical details of the treatment units will be included in the final report.

The participants also raised comments on technical information about the incinerator and waste management in general. Wet scrubbers will be used in the incinerators to reduce emissions where food waste and sewage sludge is planned to be incinerated. The remarks for the draft CEE states that dewatering the wastes will increase the efficiency of the incinerators; thus, decrease fossil fuel usage and emissions. Considering these valuable comments, a decanter unit will be used in the treatment system in order to reduce the water content of the sludge before incineration. A waste management plan for the construction and operation phase covering handling, storage and disposal steps is being prepared and will be included in the final report.

Other Comments

The ICG suggested that further details, including additional maps, should be provided to ensure the CEE adequately describes the full scope of the proposed activity and associated actions. As recommended in the comments, the final report will be enriched with maps that will show the key features (flora & fauna, ASPA, HSM, and Important Bird Areas) along with the proposed location. The general layout shared in the draft CEE will be updated by providing more details, and corresponding sketches will be annexed to the final report. As suggested scale bars, north arrows, labels and legends will be added where appropriate.

Initial Environmental Reference State

TheICGparticipants suggested that someelements of the “Initial Environmental Reference State*”* should be further developed to form a comprehensive basis for assessing and monitoring the environmental impacts of the proposed activity*.* Specifically, the section describing flora and fauna in the report was not found sufficiently comprehensive by the ICG participants. Marine flora and fauna part of the draft CEE will be enriched by underwater observations realized by previous remotely operated vehicle (ROV) and diving studies. A map of terrestrial flora and fauna present at the proposed construction site will be included in the final report as well.

Alternatives to the Proposed Activity

International Collaboration

ICG participants suggested further information could be provided on the option of collaborating with other national Antarctic programs on the use of existing facilities. However, this option does not seem functional considering a large number of scientists from Turkey participates in the annual expeditions. As stated in the draft CEE report, other Antarctic Programmes rightfully will prioritise their research programmes and are able to host a limited number of researchers from other countries. In addition, the situations such as the Covid-19 pandemic make it nearly impossible to host scientists from other countries.

Selection of the Location

The selection of Horseshoe Island among other alternatives and criteria during the selection process was inquired in the ICG comments. Possible locations for camp/station sites have been evaluated since the first Turkish Antarctic Expedition (TAE-I) in 2017. As stated in the draft CEE report, with the contribution of Turkish polar scientists, 17 possible locations have been evaluated regarding many factors such as topography, climate conditions, sea ice, protected areas, biodiversity and accessibility. The results are analysed with Analytic Hierarchy Process (AHP) method and four candidate locations became prominent. After a detailed discussion among the four candidate sites, Horseshoe Island has been selected as the most appropriate site for establishing a research station. Further details on the selection will be added to the final CEE report.

Wind Turbines

Several participants expressed their concerns about the environmental impacts of the wind turbines on the birds, especially considering Lagotellerie Island. Although a limited number of Adelié penguins, shags, skuas and Antarctic terns were observed throughout the island during former visits, no significant presence of these birds was recorded in the proposed construction area. Vertical axis wind turbines were chosen for the station, which poses significantly less risk to birds compared to alternatives. However, the comments involved negative opinions on the use of wind turbines due to the lack of information and insufficient observation of bird migration paths. Therefore, the construction and use of wind turbines will not be considered until this data gap is closed after the establishment of the station.

Water Supply

Supplying water from the lakes was not welcomed by the countries that provided comments since deep lakes in Antarctica are deemed as sensitive ecosystems. Considering these valuable recommendations, seawater will be desalinated for domestic water use instead of supplying water from the lakes. The reverse osmosis method will be employed to provide domestic water. Technical aspects and possible environmental impacts of reverse osmosis will be included in the final report.

Predicted Impacts of Climate Change

Further information about potential environmental consequences of climate change and consideration of natural hazards such as earthquakes and tsunamis in the location of the proposed activity was requested by the participants. The impacts of possible earthquakes have been taken into account in the static calculations of the main and ancillary buildings during the design phase. The problems that may arise due to the melting of permafrost are considered regarding the structure and installation depth of the foundations. The future sea-level rise due to the global climate change was regarded during the general layout placement, and the distance of buildings to the shoreline were determined. Environmental impacts that may occur due to climate change in the future and related mitigation measures will be added to the final report.

Impacts and Mitigation

The ICG Participants noted that the prediction of impacts could be developed and better supported. Based on the comments, the Impact Assessment section of the report will be reviewed, and the methodologies of impact identification and assessment will be added. Additionally, significance ratings in the impact matrices will be re-evaluated and details on the scaling of these ratings will be included in the relevant section.

Several participants recommended describing some elements of the proposed activity in more detail and considering the full impacts of those activities on the terrestrial and nearshore marine environment. Participants also suggested that further information and assessment would be better evaluated in the draft CEE, including:

Biosecurity Measures

ICG participants emphasized the high risks of the introduction of non-native species in the Antarctic Peninsula region and recommended explaining specific arrangements to prevent non-native species introduction effectively (including cleaning and inspections), monitoring and response. The final report will present more details on biosecurity measures (such as planning, cleaning processes, personnel training and visual inspections).

Earthworks

Several participants stated the draft CEE report would benefit from details about how excavation and presence of buildings will alter the physical structure of the ice-free ground and drainage of melted snow, measures against dust generation and how the dust will affect the terrestrial and nearshore marine environment. The elevated design of the buildings will not pose a change for the drainage of melting snow and ice in the sloping land. Additionally, a modelling study on the snow accumulation was conducted where the outer shell and the layout of the buildings were designed to minimise the snow accumulation. The usage of precast concrete foundations and the elevated structure of the main and ancillary buildings will change the landscape at a minimum level; thus, reducing the environmental impacts. Besides the installation of precast foundations, a limited amount of excavation is planned only at the foundation pad zones during the construction. Excavated material will be used in backfill and levelling of the routes and ground for laydown areas. The estimated amount of the excavated material will be presented, along with the updated mitigation measures in the final report. The construction works do not involve many activities that will generate dust. The crushing of the excess excavated material for the ground levelling is a major source of dust, which will be mitigated by watering the surrounding to prevent the transport of the particles. Since the construction does not involve any explosions and/or piling, exceeding the noise threshold levels is not expected. However, noise levels will be regularly monitored by a sound-level meter at different locations of the construction site. If the sound level exceeds the determined thresholds, simultaneous activities will be stopped, and the noise level will be reduced.

Management Plans

The ICG Participants noted that measures related to oil spills and waste management would be better if supported with management plans, namely Oil Spill Contingency Plan and Waste Management Plan. With the final report, details on the mitigation measures, training and response plan will be presented within the oil spill contingency plan that is under preparation. In addition, the Waste Management Plan, which will include the type, amount, storage, transportation and disposal details of the wastes that will be generated during the construction and operation of the station, will be shared in the final report.

Monitoring

Some comments suggested that further details of the planned monitoring programme should be presented such as objectives, impacts of monitoring, number and locations of sampling sites, monitoring of biota. Participants also recommended Turkey to consider increasing the frequency of measurements. The measurement frequencies of the parameters in the presented monitoring plan will be increased considering the comments. Additionally, details concerning the purpose of the monitoring program to be executed, parameters to be measured and sampling points will be given in the final report.

Cumulative Impacts

The ICG commenters pointed out that further description of the indirect and cumulative impacts of the proposed activity will be beneficial. The Final CEE will provide additional information on cumulative impacts arising from the combination of the individual impacts of the proposed activity, interactions between other Antarctic Programs in the region, interactions with touristic activities, how the operation of the station will have impacts on the station area, Horseshoe Island and Antarctic Peninsula.

Gaps in Knowledge and Uncertainties

The ICG Participants suggested that this section should be further improved to provide detail while discussing knowledge gaps and uncertainties in the draft report. Gaps in Knowledge and Uncertainties section in the draft CEE report will be updated regarding the recommended uncertainties and methods to clear these gaps.

As mentioned in the draft report, a limited number of Adelié penguins, skuas, Antarctic terns and shags were recorded during the former visits to the region, while no groups were detected in size of a “colony”. Since short-term Antarctic expeditions did not allow obtaining long-term data on the region, a study on the migration routes could not be conducted. An intensive study on this subject will be carried out after the establishment of the station, which will -depending on the data to be obtained- enable the installation of wind turbines in the future. Since the use of regional lakes as the domestic water source was cancelled due to reasonable comments on the related environmental impacts, the uncertainties on this issue will not be further discussed in the final report.

Conclusions of Draft CEE Report

The ICG advised that the statement of “proposed activity would lead to minimum disturbance of the environment” is not adequately supported by the information contained within the draft CEE. This statement will be replaced by “more than minor or transitory” to comply with Article 3 of Annex I and will be supported with related data in the final CEE report.

It was mentioned in the draft CEE report that short-term expeditions could lead to similar or higher carbon emissions compared to the operation of a station in the long term. Some comments on the draft CEE noted that the operation of the proposed station would still involve shipping support. As suggested by the ICG participants, this statement will be reviewed in the final report.

Summary

Turkey conveys its appreciation to the ICG participants for their valuable comments, Antarctic Treaty Secretariat, CEP Chair; and Australia for convening the ICG process and providing an outstanding ICG report. The draft CEE report will be revised based on comments received from ICG participants and the discussions that will be held during the CEP meeting. Turkey anticipates delivering the final CEE report in due time.

For further comments or information, please contact:

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