Appendix 21.1: Environmental and Social Assessment of the Pasha Dere Receiving Terminal and Varna Compressor Station
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21.1 Environmental and Social Assessment of the Pasha Dere Receiving Terminal and Varna Compressor Station

21.1.1 Introduction

The South Stream Pipeline System is the collective term for the pipeline infrastructure that will transport natural gas extracted in Russia across the Black Sea and the territories of Bulgaria, Serbia, Hungary, Slovenia and Italy to Central and Southern Europe (Figure 21.1.1). The South Stream Offshore Pipeline is the offshore component of the South Stream Pipeline System. This is divided into three sectors for Russia, Turkey and Bulgaria.

Figure 21.1.1 South Stream Pipeline System

This Appendix forms part of the Environmental and Social Impact Assessment (ESIA) Report that has been prepared by South Stream Transport B.V. (South Stream Transport) specifically for the Bulgarian Sector of the South Stream Offshore Pipeline, referred to as the ‘South Stream Offshore Pipeline – Bulgarian Sector’ or as 'the Project’ throughout the ESIA Report and this Appendix.
Appendix 21.1 Environmental and Social Assessment of the Pasha Dere Receiving Terminal and Varna Compressor Station

Separate ESIA Reports have also been prepared by South Stream Transport for the Russian and Turkish sectors of the South Stream Offshore Pipeline. In addition, separate Environmental Impact Assessments (EIAs) have been undertaken by other companies for the other components of the South Stream Pipeline System.

As indicated in Chapter 5 Project Description of the Bulgarian ESIA Report, the onshore pipelines of the Project will extend approximately 2.4 km inland to a landfall facility. At this location, the Project will terminate and tie-in with the Pasha Dere receiving terminal (RT) and Varna compressor station (CS). The Pasha Dere RT and Varna CS will be designed and constructed as part of the "South Stream Pipeline System on the Territory of the Republic of Bulgaria" project that is being developed by South Stream Bulgaria AD (SSB). The Pasha Dere RT and Varna CS do not form part of the Project, but have been identified as associated facilities of the Project in accordance with the Organisation for Economic Co-operation and Development (OECD) definition¹ (see Section 1.2.2.1 Chapter 1 Introduction).

The Pasha Dere RT and Varna CS have followed a separate engineering and approval process, which included the execution of an EIA², and the review and approval of the EIA by the Bulgarian authorities on the 30th August 2013. It is the aim of this Appendix to present the key findings of the SSB EIA.

Further consideration of the Pasha Dere RT and Varna CS is also given in Chapter 21 Cumulative Impact Assessment of the Bulgarian ESIA Report, including cumulative impacts associated with the construction and operation the Pasha Dere RT and Varna CS amongst other nearby developments. Chapter 21 Cumulative Impact Assessment concluded that the environmental and social impacts of the Pasha Dere RT and Varna CS, when assessed with the Project, would not result in significant adverse residual cumulative impacts.

The sections below provide a description of the Pasha Dere RT and Varna CS (Section 21.1.2) followed by details of the potential environmental impacts associated with the construction and operation of these facilities (Section 21.1.3), using information as reported in the SSB EIA. Thereafter, Section 21.1.4 presents details of the key impact assessment statements from the SSB EIA focusing, where possible, on the impact assessment conclusions with particular reference to the Pasha Dere RT and Varna CS or the SSB project as a whole where applicable. Section 21.1.5 of this Appendix then highlights a number of Project commitments and actions that will be undertaken to coordinate the implementation of mitigation measures at the development interface points between the Pasha Dere RT and Varna CS and the Project to reduce, as far as practicable, the potential for cumulative environmental and/or social impacts.

¹ The OECD Common Approaches definition for associated facilities is “‘facilities that are not a component of the project but that would not be constructed or expanded if the project did not exist and on whose existence the viability of the project depends; such facilities may be funded, owned, managed, constructed and operated by the buyer and/or project sponsor or separately from the project.”

² Transmission Gas Pipeline “South Stream” on the Territory of the Republic of Bulgaria. Environmental Impact Assessment Report May 2013. 03-06/01-SSB-EIA. South Stream Bulgaria AD
21.1.2 Description of South Stream Pipeline on the Territory of Bulgaria

21.1.2.1 Options Considered in the SSB EIA

The EIA prepared by SSB for the South Stream Pipeline on the Territory of Bulgaria covered two options: Option 1 and Option 2 (see Figure 21.1.2). Both options follow a very similar pipeline route across Bulgaria, although the options considered locations for the Pasha Dere RT and Varna CS that were approximately 1 km apart (see Figure 21.1.2). It was concluded in the SSB EIA that Option 1 was preferable to Option 2, following the consideration of potential environmental impacts (biodiversity including protected sites, noise, vibration, landscape), technical parameters of safety, engineering constraints (i.e. river crossings), geological conditions along the pipeline routes and the overall operational accessibility to the infrastructure. The details provided in Section 21.1.3 below relate to Option 1 unless otherwise indicated.

21.1.2.2 Pasha Dere Receiving Terminal and Varna Compressor Station

The SSB project will extend from the Pasha Dere RT to the south of Varna (see Figure 21.1.1) and then on to the Bulgarian border with the Republic of Serbia. The SSB project includes a number of structures, two of which have been defined as associated facilities, namely the Pasha Dere RT and Varna CS. This Appendix thus focuses on, and presents details of, the environmental and social assessment undertaken as part of the SSB EIA for these associated facilities.

The Pasha Dere Receiving Terminal

The Pasha Dere RT will be divided into four sections, matching the number of pipelines in the Pipeline’s offshore section. Such an arrangement is needed to enable the autonomous functioning of each offshore line, as well as for the separate metering of gas quantities. The main purposes of the RT are as follows:

- Receiving of cleaning and inspection devices (pipeline inspection gauges (PIGs)) from the off-shore section of the gas pipeline;
- Launch of PIGs;
- Purification of gas;
- Preheating of gas;
- Overpressure protection;
- Metering gas consumption and quantity, as well as the control of gas quality indicators; and
- Adjustments to the volume of gas delivered into the transmission gas pipeline.

The purpose of the RT is thus the receiving, measuring, cleaning and preheating of gas, as well as metering and corrections to gas volumes and quality. The RT is also equipped with emergency block valves that can stop the flow of gas if necessary.
Figure 21.1.2 Map Showing Option 1 and Option 2 for the Pasha Dere RT and Varna CS

The Varna Compressor Station

In order to ensure the requisite gas parameters are delivered to the transmission gas pipeline terminal point, three compressor stations along the pipeline route through Bulgaria are proposed: one of which is the Varna CS. The following main processes are envisaged at the Varna CS:

- Compression of gas using gas compressor units (GCU); and
- Cooling of gas by an air cooling device unit (ACD).

Purification of gas before its compression at the Varna CS will not be required, given that the CS is located adjacent to the Pasha Dere RT. The Varna CS will prepare gas prior to its delivery to the transmission gas pipeline by drying the gas to its condensation point using water and hydrocarbons at minus 22°C at a pressure of 6.5 MPa. Key features of the Varna CS are as follows:

- The unit for connecting the CS to the transmission gas pipeline will be located adjacent to the CS. A back valve, stop valves for shutting off the CS from the transmission gas pipeline will be installed at the unit, as well as ventilation pipes with valves for releasing gas from the equipment and the CS pipelines. It is envisaged that the ventilation pipes will lead outside the site fence to a location where gas can be released safely;
- After passage through the RT, gas will be supplied via a pipeline to the Varna CS for compressing at the GCUs. Four GCUs will be installed at the CS (3 operational and 1 for back-up), each with a power of 25 MW. The proposed GCUs will have a gas turbine drive and centrifugal supercharger. The GCUs will be mounted in individual hangar-type premises, fitted with ventilation, heating, lighting and fire alarm systems. A fire-fighting water conduit is also envisaged for these premises;
- All of the CS equipment will be positioned in a modular system, with each module comprising a GCU and four ACDs. Stop valves and blow-off pipes with valves will be installed on the gas pipeline connections with these modules. After gas compression and cooling, gas will be supplied by pipe to the outlet collector;
- The main brake fittings will be installed with electrohydraulic mechanisms with control units, enabling remote and on-site (manual) system control;
- The diameters of the inbound/outbound gas pipelines of the CS, gas collectors, and pipeline connections will have dimensions that ensure that the velocity of the gas flow does not exceed 20 m/s;
- In order to prepare the gas fuel for the GCU, a power plant and a fuel gas treatment unit will be used, which will undertake purification, metering, preheating and reducing the gas to the required operating pressure;
- A vessel storeroom is planned for storing lubricating oil for the GCU and the power plant units. The storeroom would store oils in plastic containers (Euro pallets) and in barrels. The filling of the GCU and the power plant oil tanks will be carried out using mobile oil charging
devices, whilst draining of oil from the oil tanks will be undertaken using mobile oil collection units;

- In order to obtain compressed air as required for the control of the automated blow off valves, an assembly of air compressors and air collectors will be used; and

- A system for the supply of nitrogen will be installed to be used for the cleaning of the gas pipelines and equipment.

### 21.1.2.3 Summary

The sections above highlight that the Pasha Dere RT and Varna CS will comprise the following principal components and processes:

- **Pasha Dere RT:**
  - Gas measurement and surveillance;
  - Pipeline inspection gauges (PIG) station (launching and receiving);
  - Receipt of gas from the Project landfall facilities;
  - Gas purification;
  - Gas heating; and
  - Overpressure protection.

- **Varna CS:**
  - Gas compression using GCUs;
  - Cooling of gas by an ACD; and
  - Housing of an emergency block valve station that enables segments of the pipeline to be isolated for maintenance purposes.

The Pasha Dere RT and Varna CS will collectively occupy an area of approximately 30 hectares (ha) (Option 1) and will consume resources as defined within Table 21.1.1.

### Table 21.1.1 Resource Consumption during the Operation of Pasha Dere RT and Varna CS

<table>
<thead>
<tr>
<th>Resource Consumption</th>
<th>Option 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating Power (MWh/MWh)</td>
<td>1</td>
</tr>
<tr>
<td>Electricity (kWh/MWh)</td>
<td>34</td>
</tr>
<tr>
<td>Water (l/MWh)</td>
<td>3.39</td>
</tr>
<tr>
<td>Fuel Gas (kg/MWh)</td>
<td>294.6</td>
</tr>
<tr>
<td>Diesel Fuel (kg/MWh)</td>
<td>168.6</td>
</tr>
</tbody>
</table>

*Continued...*


<table>
<thead>
<tr>
<th>Resource Consumption</th>
<th>Option 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hazardous materials/ preparation</strong></td>
<td></td>
</tr>
<tr>
<td>- Oil for GCU (g/MWh)</td>
<td>3.50</td>
</tr>
<tr>
<td>- Oil for the Power Plant (g/MWh)</td>
<td>98.4</td>
</tr>
</tbody>
</table>


21.1.3 SSB Environmental Impact Assessment Topic Summary

This section of the Appendix provides a summary of the environmental assessment findings as reported in the SSB EIA. For each environmental topic considered below, a summary is provided which highlights, where possible, the impacts of the Pasha Dere RT and the Varna CS alone, or the impacts of the SSB project as a whole. The aim of this section is to provide an appreciation of the potential environmental and social impacts associated with the construction and operation of the Pasha Dere RT and the Varna CS.

21.1.3.1 Ambient Air

Baseline Conditions

The SSB EIA summarised the quality of ambient air in 2011 in urban areas near to the RT and CS. Data from monitoring stations in Varna, Dobrich and Devnya show that pollutant concentrations are generally within European Union (EU) and Bulgarian limit values set for the protection of human health. At the Batak (Varna) and Dobrich city centre stations, however, average concentrations of particulate matter (as PM\textsubscript{10}) are above the air quality standard. At Batak there was also an exceedance of the number of 24 hour periods in a year where the PM\textsubscript{10} concentration exceeded the standard.

The SSB EIA recognised that the main sources of pollution in these urban areas are domestic heating and road traffic, and programmes of improvement have been put in place to improve air quality. The area around the RT and CS site is more rural in nature and it is reported that there is no evidence to show that air quality standards are exceeded outside of urban centres.

Potential Impacts

The construction of the Bulgarian section of the gas pipeline as a whole was considered in the EIA. The EIA concluded that the construction stage would not considerably impact on air quality at sensitive receptors near to the construction strip.

During operation, the combustion of natural gas fuel at the Varna CS and Pasha Dere RT would result in emissions of oxides of nitrogen (NO\textsubscript{X}) to the atmosphere. Computer dispersion modelling of emissions from these sources for both project options was undertaken as part of the EIA. Results showed that there would be a small change in average ground level NO\textsubscript{X} concentrations (less than 2% of the air quality standard). It was concluded, therefore, that the
operation of the RT and CS would not cause a risk of an exceedance of air quality standards at receptors near to the project sites.

Mitigation Measures

A number of good practice suppression measures were specified in the EIA to limit emissions of dust and particulate matter during the construction of the pipeline, CS and RT, in order to control dust arisings to acceptable levels. Such measures included, but not limited to the following; covering working and storage surfaces, regular maintenance of vehicles, appropriate methods of material movement and water mist perfusion. With the implementation of such good practice measures, no further mitigation would be applied to the operation of the RT and CS, other than maintaining emissions within national and agreed permitted levels.

Residual Impacts

The SSB EIA concluded that the air quality impact of the proposed project on ambient air quality would not be significant for both options assessed.

Table 21.1.3 in Section 21.1.4 (refer to Ambient Air) provides the key assessment statements as related to air quality as taken from the SSB EIA.

21.1.3.2 Soils, Groundwater and Surface Waters

The soils and water assessment examined potential changes to the physical environment, including surface water, geology, and groundwater.

Baseline Conditions

The SSB EIA comprises a regional assessment and does not provide site specific details of the baseline conditions at the Pasha Dere RT and Varna CS. However, considering the proximity of the RT and CS to the Project, it is reasonable to extrapolate conditions as reported in Chapter 8 Soils, Groundwater and Surface Waters.

Soils within the vicinity of the SSB project include sensitive phaeozem soils. The hydrogeology of the area in the vicinity of the RT and CS is characterised by local shallow alluvial aquifers overlying the Galata Formation. The Galata Formation is confined at depth with licensed groundwater abstractions. Groundwater discharges to surface watercourses via ephemeral springs. One watercourse (a tributary to the Pasha Dere River) will be crossed by the proposed SSB pipeline route. There are no licensed surface water abstractions for drinking water supply within the vicinity of the RT and CS site.

Potential Impacts

Receptors that may be affected by terrestrial impacts include physical landscape features such as surface water bodies, groundwater aquifers and soils. Specifically, the following receptors were identified in the SSB EIA:

- **Surface water receptors**: Pasha Dere River, Karabiyuk Stream, Liman wetland;
- **Groundwater receptors**: unconfined Galata Formation, confined Galata Formation;
• **Soil receptors**: unstable features, soils (phaeozem, arenosol, cambisol, fluvisol, and regosol soil groups); and

• **Human receptors**: construction workers at the landfall section and marshalling yard.

Potential impacts associated with the SSB project are summarised in Table 21.1.2 and described below.

**Table 21.1.2 Summary of Potential Soils, Groundwater and Surface Waters Impacts**

<table>
<thead>
<tr>
<th>Landfall Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increased soil erosion</td>
</tr>
<tr>
<td>• Deterioration of surface water quality and changes to surface water flows</td>
</tr>
<tr>
<td>• Deterioration of groundwater quality</td>
</tr>
<tr>
<td>• Decreased stability of unstable features (such as existing, but stable landslides)</td>
</tr>
<tr>
<td>• Changes to the structure and integrity of organic rich top soils</td>
</tr>
</tbody>
</table>

The SSB EIA considered that impacts on soil and water would be primarily associated with the construction and pre-commissioning phase. The following potential impacts and impact pathways were considered:

• Erosion of soils, mobilisation of existing contamination, changes to surface water flow, changes to flood capacity and release of sediment into surface watercourses through land clearance and earthworks;

• Spills or leaks as a result of the use and storage of materials, and hydro-testing, may cause pollution of soil and/or water, and existing soil and/or water contamination may be mobilised;

• Groundwater levels may be lowered, and water quality may deteriorate, as a result of groundwater control;

• Construction of a stream crossing (a tributary to the Pasha Dere River) may affect stream flows, degrade water quality, and increase erosion;

• Land clearance and earthworks may reduce slope stability, particularly in areas that are already unstable, and could present a risk of slope collapse;

• Soil characteristics may be affected by soil stockpiling, compaction, and mixing of excavated soils; and

• Health and safety risks for construction workers related to soil contamination.

**Mitigation Measures**

In order to address potential impacts upon soil and water during the construction and pre-commissioning phase, a number of mitigation measures will be implemented by the SSB project. The SSB Pasha Dere RT and Varna CS will both adopt a range of mitigation measures including, but not limited to:
The water intake from surface water sources for the hydraulic testing of the gas pipeline and for other purposes during the construction phase will take place in compliance with art. 46, par. 1, it. 3 of Water Act;

The hydraulic testing of the gas pipeline should be done after development and coordinated in accordance with a detailed plan;

Selection and installation of equipment for the treatment of worker, industrial and storm wastewater from compressor stations sites, in compliance with best available techniques;

The maintenance, repair and modernisation of the treatment facilities; and

On-going monitoring of the quality of the discharged treated wastewater and storm water from the compressor stations.

These measures are envisaged to limit the impacts associated with activities such as land clearance, earthworks, open-cut river crossings, wastewater management/disposal, storm water management/disposal and accidental leakages and spillages.

During the operational phase, the SSB Pasha Dere RT and Varna CS will adopt a range of mitigation measures to limit the impacts associated with the presence of the facilities and access roads, accidental leakages and spillages, and ongoing vegetation control along the Rights of Ways (RoWs) of the respective pipelines.

Residual Impacts

Following the implementation of the above mitigation measures, no significant residual impacts on soil, surface water, or groundwater were identified by the SSB EIA.

The risks related to potential impacts on surface water, groundwater and soil are considered in the EIA to be low and manageable. In terms of soil and water, the construction and subsequent operation of the SSB Pasha Dere RT and Varna CS do not present a significant concern or risk to surface water, groundwater and soil resources.

Table 21.1.3 in Section 21.1.4 (refer to Soils, Groundwater and Surface Waters) provides the key assessment statements as related to soils, groundwater and surface water as taken from the SSB EIA.

21.1.3.3 Landscape

Baseline Conditions

Landscape classification is divided into three landscape categories in the SSB EIA:

- Continental hills dominated by sediments and arable land (Chs_al);
- Continental hills dominated by sediments and forests (Chs_fo); and
- Continental lowland dominated by sediments and arable land (Cls_al).
These have then been applied within the ‘Zone of Theoretical Visibility’ (ZTV) for a 15 km radius around each of the Varna CS and the Pasha Dere RT. This ZTV has been applied as the ‘Study Area’ for landscape character, as well as for the visual amenity\(^3\).

The landscapes have then been described as ‘Agricultural Landscape, Forest Landscape, Aquatic Landscape, Anthropogenic Landscape’ together with details of physical geography including soil formation and vegetation types. ‘Landscape structure’ is then described for the 12 National Zones as set out by the Bulgarian Regional Landscape Division which the SSB project passes through. This is also based primarily upon physical geography elements.

**Potential Impacts**

The physical impacts of the SSB proposals upon the defined landscapes are described in the SSB EIA for each National Zone. ‘Potential Viewers’ are identified as one group within each landscape type.

Further assessment is then given for the landscape and visual impact (as one general group with no specific sensitivity, rather than classified receptor groups) of the construction of the transmission gas pipeline route through the four landscapes described above. This is then repeated for operational and decommissioning phases.

Landscape and visual impacts during the construction and operational phases are summarised below:

**Construction of the Pasha Dere RT and CS**

- Pasha Dere RT and the CSs:
  - Landscape impact = Medium; and
  - Visual impact = Medium.

- Agricultural landscape:
  - Visual impact = Low.

**Construction of the pipeline route**

- Forest landscape:
  - Landscape impact = Medium; and
  - Visual impact = Medium.

- Aquatic landscape:
  - Landscape impact = direct, irreversible, negative, local and small in scale.

- Visual impact:
  - No change.

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\(^3\) Annexes 2 - 5 of the SSB EIA represent these ZTVs these encompass the entire area irrespective of topography, vegetation and built form
• Anthropogenic landscape:
  o Landscape impact = direct, irreversible, negative, local and small-scale impact.
• Visual impact:
  o No change.

Operational phase
• Landscape impact:
  o No impact.
• Forest landscape:
  o Visual impact = smaller than construction.
• Varna CS:
  o Visual impact = insignificant.

Operation of the pipeline route
• Forest and Agricultural landscape:
  o Visual impact = insignificant.

Mitigation Measures
A number of mitigation measures are proposed in the SSB EIA including the following:
• Native grass planting is proposed in areas subject to reclamation (excluding agricultural land);
• Planting is proposed to restore landscape character along the route; and
• Maintenance of trees and shrubs around the CSs for visual screening.

Residual Impacts
The SSB EIA does not specifically define residual landscape or visual impacts for the RT or CS. It is assumed that overall impact levels are as detailed in Section 21.1.3.3.

Table 21.1.3 in Section 21.1.4 (refer to Landscape) provides the key assessment statements as related to landscape and visual impacts as taken from the SSB EIA.

21.1.3.4 Biological Diversity and Terrestrial Ecology

Baseline Conditions
The area in the vicinity of the proposed Pasha Dere RT and the Varna CS comprises deciduous oak and hornbeam woodland, with some areas comprising shrub. The area is located within the Natura 2000 Galata Special Protection Area (SPA).
**Potential Impacts**

The SSB EIA identifies the potential for the development to impact habitats, flora and fauna, including species of ecological importance due to the direct loss of vegetation and habitats within the development working corridor, and potential degradation to adjacent habitats. Works will be undertaken within the boundary of the Galata SPA. The loss of habitats has the potential to adversely affect terrestrial fauna, including herpetiles, mammals and birds (including breeding and migratory birds).

Construction of the Pasha Dere RT and the Varna CS will impact upon an area of approximately 30 ha, of which 27.37 ha comprise deciduous oak and hornbeam woodland, with the remaining area comprising shrub. However, construction of the SSB Pasha Dere RT and Varna CS plus the associated access roads, temporary construction land take and pipelines will impact upon an area of 70.53 ha within the Galata SPA.

Loss of habitats and disturbance has the potential to impact upon identified species such as nightjar – this species would experience a temporary loss of breeding habitat, but would also gain due to the creation of open areas for foraging and breeding display. As this species is able to move to other available territory, impacts are considered to be not significant.

**Mitigation Measures**

Mitigation measures cited in the SSB EIA include re-planting of woodland and conversion to open grassland of the RoW. A plan will be developed for the restoration of lost and degraded habitats in line with the EU Habitats Directive and national legislation.

**Residual Impacts**

The SSB EIA does not define levels of residual impacts upon ecological receptors.

Table 21.1.3 in Section 21.1.4 (refer to Biological Diversity) provides the key assessment statements as related to biological diversity and terrestrial ecology as taken from the SSB EIA.

21.1.3.5 **Noise and Vibration**

**Baseline Conditions**

Night-time noise monitoring surveys were undertaken at residential areas in the vicinity of the proposed locations of the Pasha Dere RT and Varna CS. The results of the surveys show that, at all locations, the night-time noise levels are within the night-time noise norms for residential areas set out by the Bulgarian Ordinance No. 6/2006.

**Potential Impacts**

The assessment included in the SSB EIA considered the potential noise, vibration, and infrasound impacts associated with the operation of the compressor stations and RT, on residential areas. It also considered the potential impact of noise associated with the construction of the RT, CS and gas pipeline. The assessment of noise and infrasound involved computer modelling of emissions due to the operation of the proposed facilities. Vibration...
impacts were assessed by analysis of measurements made during the operation of a similar compressor station elsewhere. Finally a qualitative assessment was performed of the radiation impacts involved with proposed construction activities. The impacts of different options for the locations of the proposed facilities were considered.

Mitigation Measures

The majority of potential impacts were found to be within the criteria imposed by the Bulgarian legislation, and that the applied criteria relating to “comfort change” demonstrated that “comfort does not change” and thus do not require further mitigation. For those that were found to exceed the limits, mitigation measures were proposed to ensure that the emission levels generated by the activities would not exceed the relevant criteria given in the Bulgarian legislation. Impacts related to construction of the pipeline would be mitigated through restrictions on night-time working activities.

Residual Impacts

The resulting assessment of the construction activities predicted that the noise and vibration impact significance at all existing identified residential sensitive receptors would not exceed the relevant norms given in the Bulgarian legislation.

Consideration of operational noise and infrasound impacts identified that the selection of “Option 1” for the location of the Pasha Dere RT and Varna CS, would ensure that noise levels at identified receptors would not exceed the noise norms. This would also ensure that, at all identified receptors, “comfort does not change” or “comfort changes slightly”.

Consideration of the operational vibration impacts identified that the SSB project would not “create conditions of discomfort” at the CS sites, and thus impacts would not be significant at identified sensitive receptors.

Table 21.1.3 in Section 21.1.4 (refer to Noise and Vibration) provides the key assessment statements as related to noise and vibration as taken from the SSB EIA.

21.1.3.6 Waste

Baseline Conditions

The SSB EIA indicates that during the construction phase some 120,000 tonnes of surplus excavated spoil would be generated, together with smaller quantities of other construction wastes (e.g. generation of approximately 5,300 tonnes of metal waste which is assumed in the SSB EIA to be sent to local scrap collection points). Information presented in the SSB EIA indicates that the during the construction phase, hazardous wastes would be generated in the range of approximately 1,000 - 2,000 tonnes. The SSB EIA does not identify specific outlets for project waste.

Potential Impacts

The SSB EIA uses a simple matrix approach to estimate potential impacts of waste, based on whether or not waste is hazardous. Potential impacts from hazardous waste are identified for
ambient air, soil, subsoil, landscape and public health/social environment. Of these, only public health/social environment is identified as being potentially significant. Significant impacts are not anticipated for non-hazardous waste.

**Mitigation Measures**

A wide range of mitigation measures are proposed based on following relevant Bulgarian waste regulations. These include preparing a suitable waste management plan, and entering into contracts with suitably licensed companies for the proper collection, transport and disposal of waste in accordance with regulatory requirements.

**Residual Impacts**

No residual impacts are presented within the SSB EIA, although the EIA notes that with the implantation of the defined mitigation measures, operations will not exert an adverse impact on human health and the impact on the environment will be reduced to a minimum.

Table 21.1.3 in Section 21.1.4 (refer to Waste) provides the key assessment statements as related to waste management as taken from the SSB EIA.

**21.1.3.7 Socio-Economic and Health Assessment**

In relation to socio-economic impacts, the design and construction of the Pasha Dere RT and Varna CS, as well as the operation of the gas pipeline, would lead to the creation of new jobs, both directly and indirectly. In the Varna municipality and Varna Region, it is expected that most of the jobs would be related to the construction of the Varna CS. Support services for the project are also likely to generate employment in the Varna Region area. In addition to creating job opportunities, the Pasha Dere RT and Varna CS would also create beneficial economic opportunities for a number of local, regional, and potentially national, companies and subcontractors to supply services during the study, design, construction and operation of the development.

The SSB Pasha Dere RT and Varna CS is not expected to lead to economic displacement or the need for physical resettlement, as the gas pipeline and site facilities are located at over 125m from residential, industrial or other buildings⁴. Further, property owners would be compensated, prior to taking up the land required for the development, in accordance with national regulations. The sites for the Pasha Dere RT and Varna CS are located wholly on state owned land, and therefore the land required for the development would only affect a single land owner (i.e. the Bulgarian state).

The health assessment concluded that the project is not expected to cause significant health impacts to the affected population. The assessment focused on zoonotic diseases and the impact on local communities. However, the assessment did not assess impacts as related to the

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⁴ The SSB EIA states that the gas pipeline and site facilities in the territory of the Republic of Bulgaria will be located at a distance of not less than 125 m from residential, industrial or other buildings, or self-contained areas for public gathering. The SSB EIA indicates that the village of Konstantinovo in Varna is the closest to the gas pipeline route (Option 1) at a distance of 192 m.
conduct of the workforce, influx of workers, traffic or the capacity of local health and emergency resources. The SSB EIA did make recommendations on the proper management of occupational health and safety.

Table 21.1.3 in Section 21.1.4 (refer to Health Risk and Social Impacts) provides the key assessment statements as related to socio-economics and health as taken from the SSB EIA.

### 21.1.3.8 Cultural Heritage

#### Baseline Conditions

The SSB EIA cultural heritage baseline study involved desk-based research and an archaeological field survey. The desk-based component researched registered archaeological sites from the Archaeological Map of Bulgaria, scientific publications, registers of monuments of culture of the National Institute of the Immovable Cultural Heritage, archives and stocks of state-owned and municipal museums, ethnological studies, topographic maps and satellite images, orthophotography, data collected from local informants and previous studies for the South Stream gas pipeline. The archaeological field survey involved a walkover survey, collection of chronologically diagnostic artefacts, recording of surface sites and upstanding remains, and mapping of sites using GPS. A total of 124 archaeological sites were registered in the course of the search.

#### Potential Impacts and Mitigation Measures

During the construction stage, an archaeological watching brief would be maintained on all groundworks. Site specific mitigation measures for archaeological sites that would be impacted by pipeline construction works include preliminary and full archaeological survey within the areas impacted.

During the operational and decommissioning stages, if groundworks are required outside areas already impacted by previous groundworks, these would be undertaken under an archaeological watching brief.

**Pasha Dere RT**

The cultural heritage site identified within the Pasha Dere RT area comprises a modern memorial to Dr Nikola Stoyanov (1949 to 2006) of the Sofia University of Forestry. This is referred to as site BG-TCH-021 in the Project ESIA. The memorial is affixed to and engraved into an architectural fragment comprising a white marble pillar or step, possibly of antique period date. Specific mitigation measures stated in EIA Chapter XII: Material and Cultural Heritage comprise the removal of the architectural fragment to a museum (Gastec Bulgaria/PJSC Yuzhniigiprogaz 2013, p.33).

EIA Chapter XIII: Health and Hygiene Conditions, Hazardous Substances and Social and Economic Impact notes that properties 'should be acquired primarily through direct negotiations with the owners in accordance with the applicable laws and good business practices', and compensation measures and procedures related to expropriation will follow the requirements of the State Property Act and the Bulgarian Spatial Development Act as amended SG No. 99/2012. The chapter also notes that 'Additional legal consultations will be made, where necessary, in
order to minimize eventual disputes and prevent social unrest’ (Gastec Bulgaria/PJSC
Yuzhnigiprogaz 2013b, p.101).

Other cultural heritage sites identified in the municipality of Avren comprise the following:

- A prehistoric settlement at the village of Avren (Site no. 116) which is crossed by the pipeline route and will be subject to preliminary archaeological survey;
- A late antique settlement at the village of Avren (Site no. 117), which is located within the easement and will be subject to archaeological watching brief;
- Late antique settlements at the villages of Kazashka Reka/Avren (Site no. 115) and a late antique and medieval settlement at the village of Tsarevtsi (Site no. 110), which are crossed by the route and will be subject to preliminary archaeological survey;
- A tumulus (Site no. 111) which is crossed by the route and will be subject to full survey; and
- Three tumuli (Sites no. 112, 113, 114) which are not affected by the route and for which no conservation measures are required.

**Varna CS**

Cultural heritage sites identified in the Municipality of Varna comprise:

- A tumulus (Site no. 122), which is not affected by the route and so no conservation measures are required; and
- A tumulus (Site no. 123), which is crossed by the route; mitigation measures will comprise a full survey.

**Residual Impacts**

The SSB EIA does not include details of residual cultural heritage impacts. Table 21.1.3 in Section 21.1.4 (refer to Material and Cultural Heritage) provides the key assessment statements as related to cultural heritage as taken from the SSB EIA.

**21.1.4 Summary of Pasha Dere and Varna SSB EIA Assessment Conclusions**

A summary of the key assessment statements from the SSB EIA is provided in Table 21.1.3. This focuses, where possible, on the impact^5^ assessment conclusions with particular reference to the Pasha Dere RT and Varna CS or the SSB project as a whole, where applicable.

The SSB EIA includes a Non-Technical Summary (NTS) which provides a concise summary of the technical assessments of each topic and their conclusions.

---

^5 Where the key assessment statements within Table 21.1.1 include the term cumulative impact – the scope of the SSB Project EIA cumulative assessment did not extend to include the South Stream Transport Project and thus only refers to those projects as defined within Table 21.1.1, Chapter 15 of the SSB Project EIA. The cumulative assessment for the Pasha Dere RT and Varna CS and the Project is presented within the main text of Chapter 21 Cumulative Impact Assessment.
### Table 21.1.3 Summary of Conclusions Extracted From the SSB EIA

<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ambient Air</strong></td>
<td>Chapter IV</td>
<td>Chapter 4</td>
<td>Chapter IV</td>
<td>“The impact of the construction stage of the Investment Proposal on the quality of the ambient air would be direct, short-term, temporary, reversible, without cumulative impact, limited within the area of the construction strip.”</td>
</tr>
<tr>
<td></td>
<td>Part VII</td>
<td>Parts V and VII</td>
<td>Part X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Section 2</td>
<td>Section 3</td>
<td>Page 72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Page 102</td>
<td>Page 104</td>
<td>Page 72</td>
<td></td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td>Chapter X</td>
<td>Chapter X</td>
<td>Chapter X</td>
<td>“The impact of both Options for implementation of the Investment Proposal on the quality of surface and groundwater is comparable and would not limit the contracting authority in the selection of a final option based on criterion, which would not be related to water quality.”</td>
</tr>
<tr>
<td></td>
<td>Part VII</td>
<td>Part IV - VI</td>
<td>Part VII and IX</td>
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</tr>
<tr>
<td></td>
<td>Page 102</td>
<td>Page 10</td>
<td>Page 120</td>
<td></td>
</tr>
</tbody>
</table>

*The impact of the operation stage of the Investment Proposal on the quality of the ambient air would be direct, permanent, reversible, without cumulative impact, limited within the area of the platforms of Varna, Lozen and Rasovo Compressor Stations, Pasha Dere Receiving Terminal and Provadia Distribution Centre.*
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils</td>
<td>Chapter VII</td>
<td>Chapter VII</td>
<td>Chapter VII</td>
<td>&quot;The main activities during the construction of the gas pipeline (laying of the pipes) and construction of the technological sites, laying of telephone cables, which will have impact on the soils are related to excavation and filling works, followed by installation works. During the construction of the receiving terminal and of compressor stations in addition to excavation works, construction and installation works also have a large share [of the impact].&quot;</td>
</tr>
<tr>
<td></td>
<td>Part II</td>
<td>Part VI</td>
<td>Part VII</td>
<td>&quot;The area of the permanent technological sites on agricultural land of 2nd Bonitet category...is insignificant. The receiving terminal and CS Varna, the total area.....are located on land without a category - forest lands. The existing manner of permanent use in the servitude area of these sites will be restored after suitable recultivation measures but the presence of not very large equipment and marking will hinder the maneuvering of the cultivating agricultural equipment. Part of the technological sites will fall within the construction strip, and another part – beyond the servitude of the gas pipeline.&quot;</td>
</tr>
<tr>
<td></td>
<td>Page 5</td>
<td>Page 17</td>
<td>Page 57</td>
<td>&quot;Recultivation measures will be implemented after completion of the construction on these sites, as well as in the servitude areas around the permanent facilities, as a result of which the existing manner of permanent land use will be restored – in the agricultural territories.&quot;</td>
</tr>
</tbody>
</table>

Continued...
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geological Basis</td>
<td>Chapter VI</td>
<td>Chapter VI Part V</td>
<td>Chapter VI Part IX</td>
<td>“The impact is defined as direct, short lasting (only during the period of pipeline laying in the respective section of the route), temporary, negative, reversible, without cumulative effect.”&lt;br&gt;“The impact is defined as weak according to the degree and can be avoided without the application of special measures other than the observance of best construction and operation practices.”</td>
</tr>
<tr>
<td>Landscape</td>
<td>Chapter VIII</td>
<td>Chapter VIII Part VI</td>
<td>Chapter VIII Section X</td>
<td>“As a result of the existence of temporary soil depots, the presence of construction machinery, etc., during the construction stage the visual perception of the landscape will change. The impact is assessed as temporary and short-term, with low to medium visual significance, and related only to the construction stage.”&lt;br&gt;“No cumulative impact is expected as a result of the construction of the gas transmission system.”&lt;br&gt;“The process of operation of the gas pipeline in Options 1 and 2 is not related to impacts on the components of the landscape. No significant, negative, direct, visual, cumulative or another type of impact is expected.”&lt;br&gt;“The visual impact during the operation of Varna CS, Lozen CS and Rasovo CS and the transmission gas pipeline for the two route Options is assessed as insignificant.”</td>
</tr>
</tbody>
</table>

*Continued...*
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Diversity</td>
<td>Chapter IX</td>
<td>Chapter IX</td>
<td>Chapter IX</td>
<td>Protected Areas</td>
</tr>
<tr>
<td></td>
<td>Part 2</td>
<td>Part VI</td>
<td>Part VIII</td>
<td>&quot;The Investment Proposal does not pass through protected areas&quot;**.</td>
</tr>
<tr>
<td></td>
<td>Page 4</td>
<td>Page 30</td>
<td></td>
<td>Important Herpetological Areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&quot;The Investment Proposal does not affect the Important Herpetological Areas that are identified in our country.&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Summary Statements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&quot;The number of NATURA 2000 sites under the two directives crossed by Option 1 is 17, and by Option 2 the number of the NATURA 2000 sites is 20.&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>&quot;The area affected within the NATURA 2000 sites is 4356 decares [435.6 hectares] in Option 1, and 4445 decares [444.5 hectares] in Option 2, i.e. 89 decares [8.9 hectares] less for Option 1; part of this area is not damaged during the construction activities, such as the water surface in the case of horizontal drilling. This unaffected part is approximately the same for both Options.”</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>&quot;The length of the route crossing the NATURA 2000 sites is 60.5 km in Option 1 and 71.8 km in Option 2, i.e. 11.3 km less for Option 1.”</td>
</tr>
</tbody>
</table>

Continued...
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Diversity</td>
<td>Chapter IX</td>
<td>Chapter IX</td>
<td></td>
<td>Bats</td>
</tr>
<tr>
<td></td>
<td>Part 2</td>
<td>Part VI</td>
<td></td>
<td>&quot;Sensitivity of the group to mortality of individuals: low&quot;</td>
</tr>
<tr>
<td></td>
<td>Page 4</td>
<td>Page 30</td>
<td></td>
<td>Duration: short-term (only during the Construction Phase)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Spatial scope: construction line, roads next to it</td>
</tr>
</tbody>
</table>
|                     |             |                       |                        | Degree of significance: moderate."
| Bat Roosts          |             |                       |                        | "Sensitivity of the group to damage of roosts: low; moderate during the breeding season and during wintering."
|                     |             |                       |                        | Duration: long-term. |
|                     |             |                       |                        | Spatial scope: the construction line. |
|                     |             |                       |                        | Degree of significance: moderate."
| Bird Species        |             |                       |                        | "Duration: short term" |
|                     |             |                       |                        | Range: only in the construction ground |
|                     |             |                       |                        | Value of importance: Value of 4, modest effect, possible reduction with the application of appropriate measures |
|                     |             |                       |                        | Reversibility: for the specimens affected – irreversible; for the populations affected – reversible." |

Continued...
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Diversity</td>
<td>Chapter IX</td>
<td>Chapter IX</td>
<td>Chapter IX</td>
<td>Foraging Habitat</td>
</tr>
<tr>
<td></td>
<td>Part 2</td>
<td>Part VI</td>
<td>Part IX</td>
<td>&quot;Duration: short term</td>
</tr>
<tr>
<td></td>
<td>Page 4</td>
<td>Page 30</td>
<td>Page 186</td>
<td><em>Range: for open, forest and shrub habitats only in the construction ground; for water and wetland habitat some distance from the construction ground</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>Value of importance: Value of 4, modest, manageable effect</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><em>Reversibility: reversible for open and partially for shrub habitats, irreversible for forest habitats during the operation phase.</em>**</td>
</tr>
<tr>
<td>Habitat Fragmentation due to Pipeline</td>
<td>&quot;Duration: short term</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Range: for open, and shrub habitats only in the construction ground; for forest habitat some distance from the construction ground</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Value of importance: Value of 2, small impact</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Reversibility: reversible for open and partially for shrub habitats, irreversible for forest habitats during the operation phase&quot;</td>
<td></td>
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</table>

"In conclusion, we can say that there is probability of direct damage to individual specimens of some rare and protected species during the construction, but with the implementation of the mitigation measures prescribed, the expected impact on the protected species will be reduced to negligible. No significant negative impact is expect on the protected plant species."
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise &amp; Vibration</td>
<td>Chapter X</td>
<td>Chapter X</td>
<td>Chapter X</td>
<td>&quot;Analysis of results from the assessment of predicted noise levels from Pasha Dere RT and Varna CS, Lozen CS and Rasovo CS according to the scale of &quot;comfort change&quot; for the index of infrasound showed that for all urban areas under this study the comfort change assessment is in zone A - &quot;comfort does not change.&quot;</td>
</tr>
<tr>
<td></td>
<td>Section II</td>
<td>Section VI</td>
<td>Section VII</td>
<td>&quot;Analysis of results from the assessment of predicted noise levels from Pasha Dere RT and Varna CS, Lozen CS and Rasovo CS according to the scale of &quot;comfort change&quot; for the index of low frequency noise showed that for all urban areas under this study with the exception of the village of Lozen the comfort change assessments are in zone A – &quot;comfort does not change&quot;, and for the village of Lozen – assessment in zone B – &quot;comfort changes slightly.&quot;</td>
</tr>
<tr>
<td></td>
<td>Page 5</td>
<td>Page 22</td>
<td>Page 81 - 99</td>
<td>“Considering conducted experimental studies on vibration propagation for the foundations of GTCU in the ground around them, and taking into account that for the designed compressor stations for gas pipeline “South Stream”, GTCU25 are chosen with frequency of rotation of 5000 rev/min, it can be convincingly stated that ground vibrations generated by the operation of compressor units of Varna CS, Lozen CS and Rasovo CS do not create conditions of discomfort and present no danger to humans even at the sites of the compressor stations.”</td>
</tr>
</tbody>
</table>

Continued...
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
</table>
| Waste               | Chapter XI  | Chapter XI           | Chapter XI             | "The separate collection of the waste generated in the course of construction and operation of the gas pipeline, the transport and delivery of this waste to natural or legal persons holding a permit for carrying out operations including waste recovery and/or disposal under Article 35 of the WMA or an integrated permit, as well as the recovery of construction and demolition waste in conformity with the procedure described above in Section VII, It. 1.3.1.1., are operations which will not exert an adverse impact on human health and the impact on the environment will be reduced to minimum."
|                     | Section II  | Section VI           | Section I              | "The expected impacts of the waste generated in the course of construction, of operation and of decommissioning of the Investment Proposal “Transmission gas pipeline “South Stream” on the territory of the Republic of Bulgaria” (in the course of construction), permanent or periodical (in the course of operation), insignificant and reversible." |
|                     | Page 6      | Page 19              | Page 90                |                                  |
| Health Risk and Social Impacts | Chapter XIII | Chapter XIII         | Chapter XIII | "In strict compliance with the statutory requirements and the measures and recommendations for mitigation of the unfavourable impacts, the implementation of the Investment Proposal is eligible in terms of the health risks to the affected population."
|                     | Section II  | Section VI           | Section XI             | "The smooth and flawless construction, operation and decommissioning of the Investment Proposal is not expected to cause significant and substantial health risks to the affected population." |
|                     | Page 6      | Page 16              | Page 104               | "It is expected the implementation of the Investment proposal to create new direct and indirect jobs during the construction of the gas pipeline and the associated infrastructure. Some of these jobs will be maintained during the operation stage as well." |
|                     |             |                      |                        |                                  | Continued...
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material and Cultural Heritage</td>
<td>Chapter XII</td>
<td>Chapter XI</td>
<td>Chapter XI</td>
<td>“The major threat to the monuments of the immovable cultural heritage stems from earthworks.”&lt;br&gt;“Where the prescribed conservation measures are implemented, no significant impact on the monuments of the immovable cultural heritage is expected during the construction and operation stages of the gas pipeline “South Stream” (Option 1 and Option 2).”</td>
</tr>
<tr>
<td>Section II</td>
<td>Section XI</td>
<td>Section IX</td>
<td>Page 35</td>
<td></td>
</tr>
<tr>
<td>Page 3</td>
<td>Page 14</td>
<td>Page 35</td>
<td>Page 35</td>
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</tr>
</tbody>
</table>

**Cumulative Impact Assessment†**<br>N/A N/A Chapter XV<br>**Construction Phase**<br>“The main cumulative impact during the gas pipeline construction is expected from the transportation activities and from such related to crossing of surface water bodies. Temporary and insignificant impacts are also possible in case of simultaneous construction of other investment projects and in those cases it would not be required to apply specific measures for reducing the cumulative impact.”<br>**Water**<br>“Provided the Investment Proposal instructions and the methods accepted for performance of construction would be complied with, no resulting cumulative impact is expected.”

**Geological Basis**<br>“Cumulative impact may be expected in the section, where the route of the “South Stream” gas pipeline would pass near the route of the “Nabucco” gas pipeline route. The impact during construction is assessed as insignificant, local, because it would be limited to the lines of the trench, which would run 3 m deep.”

*Continued...*
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
</table>
| Cumulative Impact Assessment†† | N/A | N/A | | "The territorial scope of the cumulative impact is expected to be local, within the range of the construction strip along the gas pipeline route and the outlines of the construction sites of the relevant investment proposals. The degree of cumulative impact is expected to be negligible with application of recultivation activities and compliance with the recommendations of this report."

**Noise**

"During the construction of the receiving terminal and compressor stations a level of noise impact would be expected for any 24-hour period of less than 45 dB."

**Waste**

"A reduction of the quantities of waste generated would be achieved by applying good practices in waste management activities. In this connection, there is no need for additional measures for limiting cumulative impact on waste to be applied".

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<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Impact Assessment‡</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
<td>Heritage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>“All investment proposals identified within the lines of the 2 km-wide corridor under examination may have a cumulative impact on sites of the immovable cultural heritage. In order to limit the cumulative impact of the construction of the individual projects it would be required to have an archaeologist exercise control during the performance of excavation works.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>In order to prevent impact on the sites described and loss of artefacts it would be necessary to apply the conservation measures envisaged – preliminary archaeological studies prior to the performance of construction works.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Biodiversity</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“Temporary impacts, such as nuisance, would be possible if the Investment proposal construction stage would coincide in time with the construction of other projects. These impacts would be manifested as noise, vibrations, visual impact and permanent presence of humans and mechanical aids after application of the proposed mitigation measures are expected to be temporary, short-term and with low significance. They could lead only to transient migration of specimens into territories near to the affected ones but will have no significant impact on the population structure of the types subject to conservation.”</td>
</tr>
</tbody>
</table>

Continued...
<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Methodology</th>
<th>Baseline Environment</th>
<th>Assessment Conclusions</th>
<th>Key Impact Assessment Statements*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative Impact Assessment‡</td>
<td>N/A</td>
<td>N/A</td>
<td>Page 61</td>
<td><strong>Operational Phase</strong></td>
</tr>
<tr>
<td></td>
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<td></td>
<td>“No cumulative impact on the environment components along the linear part of the IP “Transmission gas pipeline “South Stream” on the territory of the Republic of Bulgaria” is expected during the operation Cumulative impact may be expected from the operation of Pasha Dere receiving terminal, Varna Compressor Station, Lozen Compressor Station and Rasovo Compressor Station. The operation of the said technological elements during the operation has an impact on the ambient air component and noise component.”</td>
</tr>
</tbody>
</table>


** Protected areas’ (in the context of Protected Areas Act) do not include those as defined under 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora i.e. Natura 2000 sites.

† The scope of the SSB Project EIA cumulative assessment did not extend to include the Project and only refers to projects as defined within Table 21.1.1, Chapter 15 of the SSB Project EIA.

†† The scope of the SSB Project EIA cumulative assessment did not extend to include the Project and only refers to projects as defined within Table 21.1.1, Chapter 15 of the SSB Project EIA.

‡ The scope of the SSB Project EIA cumulative assessment did not extend to include the Project and only refers to projects as defined within Table 21.1.1, Chapter 15 of the SSB Project EIA.
21.1.5 **Environmental and Social Commitments**

Based on the information provided within Table 21.1.3, and taking into consideration the conclusions within *Chapter 21 Cumulative Impact Assessment* of the ESIA, the environmental and social impacts of the Pasha Dere RT and Varna CS, when assessed with the Project, would not result in significant adverse residual cumulative impacts.

However, a number of Project commitments and actions to coordinate the implementation of mitigation measures are presented in Table 21.1.4 at the development interface points between the Pasha Dere RT and Varna CS and the Project to reduce, as far as practicable, the potential for cumulative environmental and/or social impacts.

South Stream Transport’s environmental and social commitments, including mitigation and management of coordination measures commensurate to identified environmental and social risks, will be managed through South Stream Transport’s Environment and Social Management Plans (ESMPs).

Interface management procedures with SSB will be detailed in South Stream Transport’s Health, Safety, Security and Environmental Integrated Management System (HSSE-IMS) which will also document and set out the mitigation and management measures as mutually agreed with SSB.
# Table 21.1.4 Proposed Environmental and Social Commitments

<table>
<thead>
<tr>
<th>Environmental Topic</th>
<th>Commitments / Actions</th>
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</table>
| Ambient Air & Greenhouse Gas (GHG) Emissions | South Stream Transport will investigate whether the integration of air quality mitigation measures offer benefits in terms of mitigation consistency/working efficiencies (especially during concurrent construction phases).  
South Stream Transport will seek clarification with SSB to confirm whether hazardous waste incinerators are to be used during the construction phase, requesting their proposed location and investigate whether they will be designed and operated in accordance with Good International Industry Practice (GIIP) and comply with the applicable emission standards.  
South Stream Transport will liaise with SSB regarding their proposals to track and report annual GHG emissions from the RT and CS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Water                             | Where practicable, South Stream Transport will investigate whether the integration of soils, surface water and groundwater mitigation measures with SSB offer benefits in terms of mitigation consistency/working efficiencies.  
South Stream Transport will seek clarification from SSB regarding the plans to monitor supply wells.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Soils                             | Where practicable, South Stream Transport will investigate whether the integration of soils, surface water and groundwater mitigation measures with SSB offer benefits in terms of mitigation consistency/working efficiencies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Geological Basis                 | No commitments or actions envisaged at this stage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Landscape                        | South Stream Transport will engage with SSB to assess the potential for aligning landscape mitigation strategies and mitigation measures, where practicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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<th>Environmental Topic</th>
<th>Commitments / Actions</th>
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| Biological Diversity and Terrestrial Ecology | South Stream Transport will engage with SSB to seek alignment of the RT and CS terrestrial ecology mitigation measures with those of the Project, where practicable.  
South Stream Transport will engage with SSB to identify a site representative to work with South Stream Transport’s Ecological Clerk of Works (ECoW) to coordinate the implementation of possible mitigation measures relevant to terrestrial ecology.  
South Stream Transport will engage with SSB to ascertain whether they have considered RT and CS impacts upon ecosystem services.  
South Stream Transport will engage with SSB with an aim of developing measures to enhance biodiversity management within the wider area, where practicable. Engagement objectives include:  
Mitigation across both developments should aim to achieve a no net loss of biodiversity in natural habitat, and in the case of components of Critical Habitat, a net gain;  
Mitigation measures include habitat reinstatement and enhancement; and  
Develop a long term monitoring plan of an appropriate duration that aims to achieve no net loss/net gain.  
South Stream Transport will engage with SSB to align the Pasha Dere RT and Varna CS mitigation measures with those of the Project, where practicable. |
| Noise and Vibration                 | South Stream Transport will investigate whether the integration of noise mitigation measures offer benefits in terms of mitigation consistency/working efficiencies.  
South Stream Transport will clarify noise monitoring proposals with SSB and determine whether there are benefits in terms of integrating monitoring proposals.                                                                 |
<table>
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<tr>
<th>Environmental Topic</th>
<th>Commitments / Actions</th>
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<tbody>
<tr>
<td>Waste</td>
<td>South Stream Transport will engage with SSB to investigate the potential beneficial re-use of inert materials (soils/rock) generated by the Project and the RT and CS development to reduce the reliance on landfill disposal where practicable.</td>
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<td></td>
<td>South Stream Transport will investigate whether the SSB incinerator will be designed and operated in accordance with GIIP.</td>
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<td>South Stream Transport will engage with SSB regarding their waste management monitoring and audit proposals (e.g. auditing of waste management facilities being used).</td>
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<tr>
<td>Socio-economics and Health Assessment</td>
<td>South Stream Transport will liaise with SSB with the aim of developing a consistent (and where necessary a reciprocal) approach to a Grievance Procedure as far as practicable.</td>
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<td></td>
<td>South Stream Transport through the Community Investment Programme will work with local stakeholders and agencies to identify potential themes and initiatives for investment. Where appropriate, South Stream Transport will co-ordinate with SSB to undertake projects of joint interest.</td>
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<td></td>
<td>South Stream Transport will engage with SSB with the aim of co-ordinating construction traffic management plans (developed by the Contractor) in a manner that minimises the potential for cumulative traffic-related impacts, especially along the access road.</td>
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<td></td>
<td>South Stream Transport will engage with SSB to collectively and effectively mitigate workforce conduct issues in the community during periods of leave and outside of work hours (including addressing the issue of Sexually Transmitted Infections (STI) transmission) as well as to collectively and effectively mitigate demand on local health (and other emergency service) resources.</td>
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<td></td>
<td>South Stream Transport will liaise with SSB with the aim of understanding their approach to labour and working conditions practices and to develop a consistent approach to these as far as practicable.</td>
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<td></td>
<td>South Stream Transport will liaise with SSB with the aim of understanding their approach to security management practices and to develop a consistent approach to these as far as practicable.</td>
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<tr>
<td></td>
<td>South Stream Transport will liaise with SSB to develop consistent security management practices in line with recognised GIIP.</td>
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<td>Environmental Topic</td>
<td>Commitments / Actions</td>
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<tr>
<td>Cultural Heritage</td>
<td>South Stream Transport will investigate whether the integration of cultural heritage investigation and mitigation measures offer benefits in terms of mitigation consistency/working efficiencies.</td>
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<td>In the interest of efficient logistics and archaeological good practice, South Stream Transport will liaise with SSB with the aim of:</td>
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<td>Investigating terrestrial mitigation works (archaeological watching briefs and excavations) are either a) undertaken by the same organisation, or that b) site visits, communication and sharing results between archaeological contracting organisations is encouraged and facilitated.</td>
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<td>Assisting SSB to adopt and implement additional best practice elements of cultural heritage mitigation where practicable – such as a systematic chance finds procedure and cultural heritage awareness training for construction staff.</td>
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<td>The increase in traffic may result in greater cumulative impact upon cultural heritage and in order to minimise such impacts, South Stream Transport will liaise with SSB with the aim of developing aligned and coordinated traffic management plans.</td>
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<tr>
<td>Traffic and Transportation</td>
<td>South Stream Transport will engage with SSB with the aim of coordinating construction traffic management plans (developed by the Contractor) in a manner that minimises the potential for cumulative traffic-related impacts, especially along the access road.</td>
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<td></td>
<td>South Stream Transport will undertake further traffic assessments at the community of Priselti VZ to establish the significance of impacts.</td>
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