South Stream
Offshore Pipeline
ENERGISING EUROPE

Chapter 20: Cumulative Impact Assessment

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20 Cumulative Impact Assessment

20.1 Introduction

While the impacts of an individual project may be judged to be acceptable, there is also a need to consider the potential for a project's impacts to interact with impacts associated with other developments – so called "cumulative" impacts.

This chapter presents a cumulative impact assessment (CIA) for the Project. The sections herein present details of applicable CIA guidance, the adopted CIA methodology, CIA scoping and impact assessment. The CIA takes account of planned and reasonably defined developments in the vicinity of the Project.

20.2 Definitions

International Finance Corporation (IFC) Performance Standard (PS) 1 (Ref. 20.1) defines cumulative impacts as:

"*impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted*".

The impacts of the Project thus need to be considered in conjunction with the potential impacts from other future developments or activities that are planned and reasonably and are located within a geographical scope where potential environmental and social interactions could act together with the Project to create a more (or less) significant overall impact.

20.3 CIA Guidance

20.3.1 International Finance Corporation (IFC) Guidance

IFC PS 1: Assessment and Management of Environmental and Social Risks and Impacts (Ref. 20.1) recognises that in some instances, developers need to consider cumulative impacts in their environmental and social impact and risk identification and management process.

PS 1 states that the impact and risk identification process:

"*will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence*" including "*master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant*".

Furthermore, it goes on to state that:

"*the client can take these into account by focusing on the project's incremental contribution to selected impacts generally recognized as important on the basis of scientific concern or*

concerns from the Affected Communities within the area addressed by these larger scope regional studies or cumulative assessments".

In order to provide guidance on undertaking a CIA, IFC released a guidance note in August 2013 titled "*Cumulative Impact Assessment and Management – Guidance for the Private Sector in Emerging Markets*" (Ref. 20.2). This guidance note uses the concept of Valued Environmental and Social Components (VECs), these being VECs being environmental and social attributes that are considered to be important in assessing risk[1], which can include:

- Physical features;
- Wildlife populations;
- Environmental processes;
- Ecosystem conditions (e.g. biodiversity);
- Social conditions (e.g. health, economics); or
- Cultural aspects.

The IFC guidance note provides a six step process for assessing the potential for cumulative impacts upon VECs as follows:

- Scoping Phase I identifying – VECs, spatial and temporal boundaries;
- Scoping Phase II – other activities and environmental drivers;
- Establish information on the baseline status of VECs;
- Assess cumulative impacts on VECs;
- Assess significance of predicted cumulative impacts; and
- Management of cumulative impacts – design and implementation.

This CIA has used the IFC guidance note as a framework for assessing potential cumulative impacts associated with the Project and reasonably defined developments.

20.4 CIA Methodology

The CIA methodology adopted has been defined taking into account the six step process as detailed in the IFC CIA guidance note (Ref. 20.2) (Section 20.3.1). The bullet points presented below detail the activities that have been undertaken as part of this CIA:

- **Scoping Phase I:** this entailed defining which VECs needed to be included within the CIA taking into account the characteristics of the Project and the prevailing environmental and social conditions within areas that are potentially impacted by the Project. The VEC identification process has been assisted through the completion of engagement activities

[1] VECs are considered to be equivalent to "receptors" as defined in **Chapter 3 Impact Assessment Methodology**.

with applicable stakeholders. This phase of the assessment has also required setting temporal and spatial boundaries of the CIA for specific VECs;

- **Scoping Phase II:** this required the identification of other projects or human activities that could potentially impact upon defined VECs that could result in cumulative impacts. An analysis has then been undertaken which aims to define those development projects that are scoped into the CIA given their potential ability to generate a cumulative impact associated with the Project (due to temporal / spatial interactions with the Project);
- **Establish Information on the Baseline Status of VECs:** defining the baseline characteristics of VECs is an important stage in the CIA process, as this identifies their sensitivity to change. Note that relevant baseline information has been provided in Chapters 7 to 18 of this ESIA Report and is not reproduced here; and
- **Assess Cumulative Impacts Upon VECs:** taking into account the Project's predicted impacts upon identified VECs, an assessment has been undertaken to evaluate the ability of the Project to interact with other planned or reasonably defined developments in such a manner that gives rise to a cumulative impact (where the temporal and spatial influences may coincide). Note that the assessment presented in this chapter only considers the residual impacts arising from the Project (i.e. impacts following the application of mitigation measures as detailed in this ESIA Report). It follows that the chapter only considers those VECs that will experience any degree of residual impact associated with the Project. Thus VECs, for which there is a Project residual impact that is deemed to be insignificant in this ESIA, do not need to be included in the CIA in accordance with IFC CIA guidance note (Ref. 20.2) (see Table 20.1).

Table 20.1 Scoping Criteria for Inclusion of VECs in the CIA

Residual Impact			
Not Significant	Low	Moderate	High
Scoped out of CIA	Reviewed for potential cumulative impacts	Scoped into CIA	

As detailed in Table 20.1, where VEC residual impacts are defined as being Moderate or High Adverse, these are scoped into the CIA. Where VEC residual impacts are assessed as being Not Significant, these can be scoped out of the CIA (given that such VECs are either of negligible sensitivity or impact magnitudes are negligible – refer to impact significance matrix Table 3.3 in **Chapter 3 Impact Assessment Methodology**). For VEC residual impacts that are defined as being of Low Adverse, the applicable VECs have been subject to further evaluation to see if there is scope for cumulative impacts to be generated.

- **Assess Significance of Predicted Cumulative Impacts:** significant cumulative impacts have been evaluated as far as possible using the impact significance matrix presented in **Chapter 3 Impact Assessment Methodology**. Note that this has been possible only where the magnitude of impacts is capable of definition, for example, through readily accessible Environmental Impact Assessment (EIA) / ESIA reports or project documentation). It is beyond the reasonable scope of this ESIA Report to undertake an

impact assessment of other developments that may occur within the vicinity of the Project. Where such information is not available, the assessment of potential cumulative impacts has been qualitative, and has relied upon professional judgement using the impact significance definitions described in **Chapter 3 Impact Assessment Methodology.** The assessment has not considered unplanned events as discussed in **Chapter 19 Unplanned Events**; and

- **Management of Cumulative Impacts – Design and Implementation:** should the CIA indicate that there is a potential cumulative impact which is of Moderate or High significance, the need for additional mitigation or management actions (or monitoring) (beyond those which are targeted at Project-induced impacts as reported within this ESIA Report) has been specified.

20.5 CIA Scoping Phase I: VECs, Temporal and Spatial Boundaries

20.5.1 VEC Identification

The ESIA Report considers the potential Project impacts across a wide range of VECs. These VECs have been defined by taking into account the prevailing environmental and social conditions in the Project Area, and the ability of the Project to impact upon these resources (during all Phases of the Project). Consultation with relevant stakeholders has been a key component of the environmental and social resource identification process – stakeholder engagement activities are detailed in **Chapter 6 Stakeholder Engagement**.

A summary of the VECs (receptors) that have been considered within this ESIA Report, and thus within this CIA, comprise the following:

- Physical (i.e. non-living environmental components, including air quality, water bodies, landscapes, terrestrial soils, marine sediments and geology);
- Marine ecology (i.e. marine habitat, flora and fauna);
- Terrestrial ecology (i.e. terrestrial habitat, flora and fauna); and
- Human (i.e. landowners and residents of local communities, local economy, marine users, cultural heritage).

20.5.2 Temporal and Spatial Boundaries

The CIA temporal boundary covers the Project Construction and Pre-Commissioning Phase and the early Operational Phase. However, the degree of uncertainty increases the further into the future the assessment extends. As such, potential cumulative impacts during the Decommissioning Phase have been scoped out of the assessment given that the decommissioning programme is uncertain and will be developed during the Operation Phase of the Project.

A review, and relevant studies if necessary, will be undertaken during the Operational Phase to confirm that the planned decommissioning activities are the most appropriate to the prevailing

circumstances. The review would outline management controls and demonstrate that the decommissioning activities will not cause unacceptable cumulative environmental and social impacts should there be other developments in the vicinity of the proposed decommissioning works.

The geographic boundaries of the CIA have been defined taking into account the Project characteristics (**Chapter 5 Project Description**) and the assessment areas applied to defined VECs as included within the various technical assessments (Chapters 8 to 18) within this ESIA Report. A flexible approach has been maintained, such that the boundaries of the assessment vary depending on the characteristics of the potentially impacted VEC. The geographic boundary thus varies from the space occupied by a small VEC feature (e.g. a discrete feature of cultural heritage value) to a large geographic region or habitat within which a particular VEC occurs (e.g. habitat occupied by a protected species). The spatial extent of relevant VECs is detailed in the various technical assessments as presented within this ESIA Report.

20.5.3 Further Evaluation of Low Significance Impact to VECs

Table 20.2 presents a summary of the impact assessment as reported within this ESIA Report and identifies residual impacts on defined VECs during the Project Construction and Pre-Commissioning and Operational Phases.

As per the IFC guidance note (Ref. 20.2), this CIA considers those VECs that will be impacted by the Project with any degree of residual impact – thus VECs for which there is an impact that is deemed to be Not Significant do not need to be included and can be scoped out of this CIA. Where the Project residual impact significance is defined to be Moderate or High, the applicable VEC is scoped into the CIA. Residual impacts defined as Low have been subject to further evaluation in order to see if there is potential for cumulative impacts to be generated. Text highlighted in grey in Table 20.2 indicates that the VEC and associated impact source are scoped into the CIA on the basis of a High, Moderate or Low (following further evaluation) residual impact.

Table 20.2 illustrates the VECs and impact sources scoped into the CIA on the basis of a **Moderate Adverse** residual impact, which are:

- Construction Phase impacts upon the prevailing landscape character and visually sensitive human receptors;
- Reduced residential amenity for residents in local communities, specifically northeast Varvarovka, during the Construction and Pre-Commissioning Phase due to potential combined noise and visual impacts;
- Construction Phase impacts upon marine cultural heritage resources; and
- Waste disposal of material at the Alfa Landfill.

These issues are further considered in Section 20.7 together with discussion of selected VECs which experience **Low Adverse** residual impacts, in order to explore the potential for cumulative impacts. Section 20.7 also includes, on the basis of professional judgement, some VECs which experience a **Not Significant** residual impact.

Table 20.2 Summary of Project Residual Impacts

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
Soil, Surface Water and Groundwater (Chapter 8)	Soil	Potential contamination of the soils through use and storage of materials, increased susceptibility to erosion, changes in soil properties and unstable ground (Construction and Pre-Commissioning Phase). Potential for leaks and spills, vegetation management along the permanent Right of Way (RoW), and interaction of Project infrastructure with natural geomorphological processes (Operational Phase).	Low Adverse	Low Adverse
	Surface Water	Potential contamination through use and storage of materials, surface water run-off across disturbed soils and river crossings by the Pipeline and access road (Construction and Pre-Commissioning Phase). Potential contamination by surface water run-off and access road, and river crossings by the Pipeline and access road (Operational Phase).	Not Significant to Low Adverse	Not Significant to Low Adverse

Continued...

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Groundwater	Potential contamination through use and storage of materials, groundwater control, the mobilization of existing contamination and hydro-testing (Construction and Pre-Commissioning Phase). Potential contamination and the potential influence of the pipeline structure on the groundwater flow regime (Operational Phase).	Not Significant to Low Adverse	Not Significant to Low Adverse
Air Quality (Chapter 9)	Human receptors	Emissions from marine vessels and construction plant during pipeline installation (Construction and Pre-Commissioning Phase).	Not Significant (CO, benzene, PM and SO_2), Low Adverse (NO_2)	Not Significant
		Dust generation (Construction and Pre-Commissioning Phase).	Not Significant	
		Emissions from road traffic movements (Construction and Pre-Commissioning Phase).	Not Significant	
		Emissions from marine vessels, onshore plant, and fugitive gas emissions from gas pipeline (Operational Phase).		

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Ecological receptors (protected and non-protected habitats and vegetation	Emissions from marine vessels and construction plant during pipeline installation (Construction and Pre-Commissioning Phase).	Not Significant to Low Adverse	Not Significant
		Dust generation (Construction and Pre-Commissioning Phase).	Not Significant	
		Emissions from road traffic movements (Construction and Pre-Commissioning Phase).	Not Significant	
		Emissions from marine vessels, onshore plant, and fugitive gas emissions from gas pipeline (Operational Phase).		
Noise and Vibration (Chapter 10)	Human receptors (including residential dwellings, cemeteries and places of worship) and ecological receptors	Construction plant and vehicles (Construction and Pre-Commissioning Phase).	Not Significant or Low Adverse (associated with use of Varvarovka Bypass Road)	Not Significant / Low Adverse
		Pipeline pressure testing (Pre-Commissioning Phase).	Low Adverse (night-time noise)	
		Routine maintenance, vehicle movements and operational activities (Operational Phase).		

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
Terrestrial Ecology (Chapter 11)	Designated sites	Construction activities resulting in habitat degradation and introduction of invasive species (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant	Not Significant
	Notable habitats and flora	Loss of habitat and notable plant species resulting from vegetation clearance during soil stripping and land clearance (pipeline route, landfall facilities and construction sites) (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant	Not Significant
	Reptiles (including Nikolski's tortoise) and amphibians	Impacts upon reptiles during site preparation and construction, loss of foraging habitat during construction (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant	Not Significant

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Mammals (including bats)	Killing, injury and disturbance of individuals (including roosting bats); loss of foraging habitat during construction; noise and vibration emissions from vehicles, plant, and construction activities/disturbance to individuals during site preparation and construction works (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant / Low Adverse	Not Significant
	Invertebrates	Killing and injury of individuals during site preparation and construction and loss of foraging and sheltering habitat (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant	Not Significant
	Avifauna	Killing, injury and disturbance of birds and loss of habitat (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant / Low Adverse	Not Significant

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Aquatic receptors	Killing and injury to aquatic species (Construction and Pre-Commissioning Phase). Maintenance of the RoW area and movement of people and machinery (Operational Phase).	Not Significant / Low Adverse	Not Significant
Marine Ecology (Chapter 12)	Marine mammals	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse
	Seabirds	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse
	Plankton	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse
	Soft substrate benthos	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Benthic invertebrates	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse
	Macrophyte stands	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse
	Fish	Impacts due to construction activities (Construction and Pre-Commissioning Phase). Impacts due to operational activities (Operational Phase).	Low Adverse	Low Adverse
Landscape and Visual (Chapter 13)	Landscape character	Temporary alteration to landscape due to construction activities (Construction and Pre-Commissioning Phase). Permanent presence of landfall facilities and permanent RoW as part of the landscape; nuisance light pollution at night associated with facility lighting (Operational Phase).	Low to Moderate Adverse (Undulating Plateau LCA)	Not Significant to Low Adverse

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ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Human receptors	Construction disturbance and visual intrusion (Construction and Pre-Commissioning Phase).	Not Significant to Moderate Adverse (views of construction work on the landfall section)	
		Visual intrusion due to permanent presence of landfall facilities and permanent RoW as part of the landscape; nuisance light pollution at night associated with facility lighting (Operational Phase).		Not Significant to Low Adverse
Socio-Economic (Chapter 14) and Chapter 15 Community Health, Safety and Security	Human receptors	Employment generation (Construction and Pre-Commissioning Phase).	Beneficial	
		Potential for reduced business revenues (commercial fishing businesses) (Construction and Pre-Commissioning Phase)	Not Significant	
		Potential for reduced business revenues due to construction activity (Shingari and Don holiday complexes) (Construction and Pre-Commissioning Phase).	Not Significant	

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Human receptors (continued)	Potential for reduced business revenues due to construction activity (Anapa Resort Town tourism sector) (Construction and Pre-Commissioning Phase).	Not Significant	
		Potential for reduced business revenues due to construction activity (Varvarovka Horse Riding Business) (Construction and Pre-Commissioning Phase).	Low Adverse	
		Economic displacement due to changes in land use (Construction and Pre-Commissioning Phase).	Low Adverse	
		Impacts on public safety, including traffic related risks, and security (Construction and Pre-Commissioning Phase).	Low/Moderate Adverse	
		Impact on amenity of Sukko and Shingari beach for recreational users (Construction and Pre-Commissioning Phase).	Low Adverse	
		Reduced amenity for visitors to the Varvarovka (Russian Orthodox and Armenian) Cemetery (Construction and Pre-Commissioning Phase).	Low Adverse	
		Reduced residential amenity for residents in Local Communities, specifically northeast Varvarovka (Construction and Pre-Commissioning Phase)	Moderate Adverse	
		Spread of sexually transmitted infections (STIs) due to influx of workers (Construction and Pre-Commissioning Phase).	Low Adverse	

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
Socio-Economic (Chapter 14) and Chapter 15 Community Health, Safety and Security	Human receptors (continued)	Potential for reduced property values due to the creation of safety exclusion zones (Operational Phase).		Not Significant
		Public anxiety over large volumes of gas close to local communities (Operational Phase).		Not Significant
	Local, regional and national businesses	Local and regional businesses benefit from spending on local accommodation, goods, services and facilities.	Beneficial	Beneficial
Ecosystem Services (Chapter 17)	Crops	Loss of current production and future use, reduced accessibility of land, potential loss of jobs (Construction and Pre-Commissioning Phase).	Low Adverse	Not Significant
		Severance of agricultural land and loss of productivity / efficiency due to operation of the Pipeline (Operational Phase).		
	Capture fisheries	Changes in fishery productivity, loss of access to fishing grounds, barrier to migration (Construction and Pre-Commissioning Phase).	Not Significant	Not Significant
		Potential (or perceived) disturbance to fish communities, loss of access to fishing grounds, snagging of equipment (Operational Phase).		

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Water supply	Reduced accessibility of water resources (Construction and Pre-Commissioning and Operational Phase).	Not Significant	Not Significant
	Hazard regulation	Increases in flood / landslide risk, changes in coastal erosion rates (Construction and Operational Phase).	Low Adverse	Not Significant
	Air quality regulation	Lower air quality, human health risk, impact on tourism (Construction and Pre-Commissioning and Operational Phase).	Not Significant	Not Significant
	Water quality regulation	Risk to human health (Construction and Pre-Commissioning and Operational Phase).	Low Adverse	Not Significant
	Soil quality regulation	Lower soil productivity, health risks to workers, reduced ecosystem functioning (Construction and Pre-Commissioning and Operational Phase).	Not Significant	Not Significant
	Tourism and recreation values	Reduced recreational use of area and corresponding impact on livelihoods (Construction and Pre-Commissioning and Operational Phase).	Low Adverse	Not Significant
	Cultural and spiritual values	Loss of cultural and aesthetic value of landscape and disturbance to cemetery (Construction and Pre-Commissioning and Operational Phase).	Low Adverse	Low Adverse

Continued…

ESIA Chapter	VEC	Impact Source	Project Construction and Pre-Commissioning – Residual Impact	Project Operation – Residual Impact
	Wild species diversity	Increase vulnerability of threatened species, loss of valued habitat (Construction and Pre-Commissioning Phase). Injury and death of wild species from vehicle and vessel collisions, disturbance from noise (Operational Phase)	Not Significant	Not Significant
Cultural Heritage (Chapter 16)	Terrestrial cultural heritage objects	Construction impacts and construction traffic impacts upon monuments, cemeteries (Construction and Pre-Commissioning Phase).	Not Significant to Low Adverse*	
	Marine heritage features	Construction impacts and marine traffic impacts upon marine archaeology (Construction and Pre-Commissioning and Operational Phase).	Not Significant to Moderate Adverse†	Low Adverse
Waste Management (Chapter 18)	Natural resources and the receiving environment	Waste materials generated and disposed of during the Construction and Pre-Commissioning and Operational Phases.	Not Significant to Low Adverse other than Moderate Adverse impacts as associated with waste disposal at Alfa Landfill‡	Not Significant / Low Adverse other than Moderate Adverse impacts as associated with waste disposal at Alfa Landfill

* Excludes currently unknown items and sites of heritage significance
† Excludes currently unknown marine archaeology
‡ Moderate adverse impact due to non-compliance with IFC criteria (i.e. waste disposal to an unlined landfill)

Complete.

20.6 CIA Scoping Phase II: Other Developments

20.6.1 Introduction

This section defines the planned and reasonably defined developments in the vicinity of the Project. If the Project is able to interact with such developments (temporally and / or spatially), the Project may be able to exert a potential cumulative impact.

Information has been obtained from the Project stakeholder engagement and consultation process (**Chapter 6 Stakeholder Engagement**), in particular information has been obtained from local, regional, governmental organisations and from a review of the open literature.

20.6.2 Development Proposals

The following planned and reasonably defined development proposals have been identified in the vicinity of the Project:

- Project connection with South Stream Pipeline (Turkish Sector) at the Russian / Turkish EEZ border;
- The Russkaya compressor station (CS) and associated pipelines (Ref. 20.3 and Ref. 20.4);
- Other developments as included in the Anapa District Growth Development Plan (GDP) (Ref. 20.5);
- The Residence of Utrish development (Ref. 20.6);
- The Zapovedny (Reserved) development (Ref. 20.6);
- The Club Village Chateau development (Ref. 20.6);
- The "Clearing in the Woods" ("Lesnaya Polyana") development (Ref. 20.6 and Ref. 20.7);
- Rosneft oil and gas exploration activities (Ref. 20.8);
- Other developments in eastern Sukko (Ref. 20.9); and
- The Anapolis development (Ref. 20.9).

Other than the Rosneft oil and gas exploration activities, there are no known marine development proposals outside of the Project to develop new uses or intensify existing uses in either the nearshore or offshore sections of the Project Area.

Figure 20.1 shows the location of the Russkaya CS and associated pipelines and the potential residential developments at Lesnaya Polyana (labelled A in Figure 20.1), Utrish (labelled B in Figure 20.1), Zapovedny (labelled C in Figure 20.1), Club Village Chateau (labelled G in Figure 20.1) and the Anapolis development (labelled D in Figure 20.1). Figure 20.2 shows indicative locations of conceptual developments as contained within the Anapa District GDP (also refer to Figure 14.10). These proposed developments are discussed in the sections below.

20.6.2.1 Project Connection with South Stream Pipeline at the Russian / Turkish EEZ Border

The South Stream Offshore Pipeline will traverse the Black sea via the Russia, Turkey and Bulgaria EEZs. The Project (Russian Sector) will therefore interface with the South Stream Offshore Pipeline (Turkish Sector) located in the Turkish EEZ. During the Construction and Pre-Commissioning Phase, activities taking place within Turkish waters will be similar to those taking place in the Russian offshore areas, including:

- Mobilisation of vessels to and from site and vessel movements within construction spread;
- Perform pre-lay, as-laid, and as-built ROV surveys etc.;
- Delivery of fuel, pipe and other supplies including hazardous substances to pipe-laying vessel by supply vessel;
- Storage of fuel and other hazardous materials;
- Refuelling of vessels, plant and machinery;
- Helicopter operations for crew changes;
- Maintenance of plant and machinery;
- Waste generation from vessel operations;
- Use of fresh water maker / desalination unit and vessel cooling water system; and
- Night time working.

During the Operational Phase, the South Stream Offshore Pipeline - Turkish Sector, in Turkish waters, will be subject to the same maintenance regime as being applied to the deep water pipelines in Russia (refer to **Chapter 5 Project Description**).

20.6.2.2 Russkaya Compressor Station (CS) and Pipelines

The Project landfall facilities will be connected to the Russkaya CS via four 3.2 kilometre (km) long onshore pipelines (see Figure 20.1). The Russkaya CS, and the four connecting pipelines, are being developed by Gazprom Invest as part of the "Expansion of the UGS to provide gas to South Stream pipeline" (UGS - United Gas Supply System) and do not form part of the Project. However, the Russkaya CS and the four connecting pipelines have been defined as associated facilities (refer to **Chapter 5 Project Description**)[2].

The Russkaya CS will be located in the Anapa administrative district of the Krasnodar Region on a green field site and in a relatively isolated location. The village of Gai Kodzor is located approximately 1.2 km northeast of the Russkaya CS site, whilst Sukko is located approximately

[2] OECD Common Approaches (Ref. 20.13) defines associated facilities as being "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."

2.9 km to the south and Varvarovka is approximately 4.25 km to the west of the Russkaya CS site.

The construction of the Russkaya CS forms part of the first stage (Western corridor) of the UGS expansion, which is expected to be operational in 2016. The capacity of the Russkaya CS will be increased during the second stage (Eastern corridor) of the UGS expansion, which is expected to be commissioned and operational in 2019. A storage area for material and equipment, the Materials and Equipment Depot (MED), will also be established during this second stage.

The Russkaya CS includes the following (Ref. 20.3 and Ref. 20.4) main technical equipment within the site limit:

- Input pipelines with gas inlet piping machinery stations;
- Gas treatment units;
- Compressor works with gas pumping unit (GPU) of unit rating 25 - 50 MW and individual gas air cooling units; and
- Gas flow rate metering unit (GFMU).

The Russkaya CS development footprint has been estimated based upon data as presented in the Russkaya EIA documentation (Ref. 20.3 and Ref. 20.4) as follows:

- The compressor station construction footprint is assessed to be approximately 52 ha;
- Assuming a 120 m wide construction corridor for the 3.2 km long pipelines connecting the Russkaya CS with the South Stream Transport landfall facilities, the pipeline Right-of-Way (RoW) equates to a construction area of approximately 38.7 ha; and
- The construction footprint for the Gazprom Invest permanent access road is estimated to be approximately 4.5 ha.

In addition to the above, an area of approximately 16.1 ha has been assumed to be required for a temporary construction works area (located to the northwest of the Russkaya CS construction footprint).

Given the above, the total construction footprint of the Russkaya CS development is assessed to be approximately 111.3 ha.

In addition to the above, the Russkaya CS includes a tie in with the trunk gas pipeline with a PIG receiver, a gas processing unit, emergency diesel power stations, auxiliary power supply stations, a production and operations building, a machinery and repair shop with reserve motor storage, a boiler room, a gas-meter station, a thermal waste-decontamination unit, tanks with oil products, a road vehicle car park and washing area and a sewage treatment plant.

The MED will meet Russkaya CS operational requirements by acting as a storage area for materials and equipment and will be located 290 m to the north northwest of the Russkaya CS. The MED will include an entry area with changing rooms, heated warehouse, cooled warehouse, open storage area, automatic diesel power station (ADPS), diesel storage tank and local treatment facilities for rainwater.

The main construction period for the Russkaya CS is predicted to last for 34 months. It is noted that early works and site preparation activities for the Russkaya CS commenced in early 2013. The first phase of the main construction period is anticipated to commence in January 2014 and last 22 months until October 2015. The second phase of construction is proposed to start in May 2015 and last 18 months until October 2016. A six day working week and ten hour working day are likely to be adopted during the construction phase.

The construction phase of the Russkaya CS will consist of both offsite and on-site preparatory work. The offsite preparatory work will include activities such as the construction of the planned access road, preparation of a temporary construction compound including accommodation, the delivery of pre-fabricated buildings for storage and household needs, the laying of temporary utility lines and the repair or upgrade of existing roads for use during construction. The on-site preparatory work will include temporary areas for erecting cranes, protection of underground utilities with reinforced concrete slabs, construction of storage and assembly areas, arrangement of temporary site utilities, construction of temporary pedestrian paths and lighting of the construction site. Activities involved in the construction of the Russkaya CS include excavation, piling, laying of utilities, erection of above ground structures, installation of process piping and equipment, internal plumbing work, electrical work and commissioning.

The potential environmental impacts associated with the development of the Russkaya CS are reported in the development EIA documentation (Ref. 20.3 and Ref. 20.4). As indicated above, the Russkaya CS construction programme will in part overlap with proposed Project construction works.

Given its definition as an associated facility, key findings of the Russkaya EIA are detailed in Appendix 20.1. The Appendix also presents South Stream Transport's commitments in relation to Russkaya CS as an associated facility. The commitments will be implemented though the HSSE Interface Management Procedure for Gazprom Invest which is part of South Stream Transport's HSSE Integrated Management System.

20.6.2.3 Rosneft Oil and Gas Exploration

Rosneft is a Russian oil and gas company that is planning to develop a number of concession blocks within the Black Sea off the Russian coastline, namely: the Tuapse Trough, West-Chernomorsky and the South-Chernomorsky offshore areas (see Figure 20.3).

According to Rosneft's 2012 Annual Report (Ref. 20.8), the Tuapse Trough has a potential recoverable resource estimated at approximately 1.2 billion tonnes of oil equivalent and that 3D seismic work totalling approximately 4,200 km^2 was completed in 2012, whilst 3D seismic data obtained earlier have been processed. The West-Chernomorsky area has an estimated recoverable resource equal to approximately 1.4 billion tonnes of oil equivalent within a block area of approximately 9,000 km^2. Rosneft has carried out seismic works to study the area and has identified six promising formations. Rosneft press releases (Ref. 20.10) report that two exploration wells are to be drilled in 2015 - 2016 in line with license obligations. The South-Chernomorsky area has a recoverable resource of approximately 0.47 billion tonnes of oil equivalent and the area has been subject to 2D seismic surveying in 2012.

South Stream Transport has met with Rosneft to discuss potential interactions between Rosneft's oil and gas exploration activities and the Project. However, further information detailing Rosneft's exploration locations and programme are not available at the time of writing.

20.6.2.4 The Clearing in the Woods ("Lesnaya Polyana")

This is a proposed 16.5 hectare residential development with approximately 160 land plots that is currently under construction and essentially an extension of the town of Varvarovka (Figure 20.1 – development A) (Ref. 20.6). The development site is located approximately 500 m northwest of the microtunnel entry points and 1.5 km southwest of the landfall facilities.

It is understood from the site developer (February 2014 Ref. 20.11) that construction of the access roads and site levelling have been completed, whilst works are on-going with regard to the water supply. It is also understood from the developer that some land plots have been sold, but that housing construction activities are planned this year and continue for the next two to three years. There is thus the potential for the development construction works to overlap with the construction works associated with the Project (**Chapter 14 Socio-Economics**). The development may also be defined as a sensitive receptor if some works are completed and properties are inhabited prior to the start of the Construction and Pre-Commissioning Phase of the Project, although this is considered unlikely to happen given the status of the development proposals.

20.6.2.5 The Residence of Utrish Development

This is a potential residential development in the settlement of Sukko covering an area of approximately 16 hectares, located approximately 2.55 km southeast of the microtunnelling point (Figure 20.1 – development B). This housing complex consists of (Ref. 20.6):

- 14 houses with a small number of apartments;
- 46 town houses (terraced houses);
- 44 cottages; and
- Commercial areas and social infrastructure.

It is understood from the developer (February 2014 Ref. 20.11) that four to five houses have been sold and are now occupied, whilst 20 to 25 townhouses have also been sold. The development's proposed construction phase runs from 2011 – 2015 and thus there is a potential for on-going construction works to overlap with those of the Project.

20.6.2.6 The Zapovedny (Reserved) Development

This residential development comprises approximately 114 residential dwellings located in the southern part of Sukko (area of approximately 11.5 hectares), approximately 3.5 km east-southeast of the microtunnelling point (Figure 20.1 – development C) (Ref. 20.6). It is understood from the site developer (February 2014 Ref. 20.11) that the development road system has been completed and that works are starting with regard to the electricity supply. There is thus the potential that on-going construction works overlap with those of the Project.

20.6.2.7 Other Developments in Eastern Sukko

Other potential developments in eastern Sukko include the following (Ref. 20.9) (see Figure 20.1):

- Children's Entertainment Park covering an area of approximately 89 ha which may be developed before 2019 (labelled E in Figure 20.1); and
- Resort-Residential District "Gornoye Ozero" which would comprise apartments and low-rise houses, social infrastructure (educational, health care, sport and leisure facilities) and commercial facilities (e.g. shopping centre, restaurants, hotels etc.) (labelled F in Figure 20.1). This particular development will extend over an area of approximately 240 ha. It is understood from the developer (February 2014 Ref. 20.11) that the project is at the design stage and that the aim is to have the facility fully developed before 2020.

The programme for these potential developments is uncertain, although it is considered most likely that if developed, they would be constructed after the Project Construction and Pre-Commissioning Phase.

20.6.2.8 Club Village Chateau

The Club Village Chateau development (see Figure 20.1) involves the development of approximately 45 chateaus. These chateaus will be constructed within an area of existing vineyards such that each chateau will be located within a land plot which has its own private vineyard (Ref. 20.6).

The development plot has a total area of approximately 83 ha, although the construction works are estimated to impact upon approximately 20% of the total development footprint (calculated from a review of the proposed development layout proposals) thus impacting upon an area of approximately 16.6 ha.

It is understood from the developer (February 2014 Ref. 20.11) that the development is currently on hold and that works will only proceed following completion of the Project Construction Phase given that the road which passes through the development plot will be used as a Project access road.

20.6.2.9 The Anapolis Development

This is a proposed mixed use district development that includes residential properties, commercial facilities, hotels and associated infrastructure. The development site covers an area of approximately 66.7 hectares, and is located approximately 350 m south of the Pipeline alignment (Figure 20.1) (Ref. 20.9). It is understood from the site developer (February 2014 Ref. 20.11) that some construction works are planned to start this year, although this depends upon progress in terms of water and electricity connections (understood to be planned for 2015). There is thus the potential that future construction works could overlap with those of the Project.

20.6.2.10 Anapa GDP Proposals

The Anapa GDP (Ref. 20.5) contains potential development proposals that may be developed over the next 20 years. These development proposals are at the conceptual planning stage and thus there is uncertainty as to when they will occur and their associated development footprints. Of note to this assessment is reference to the following development proposals (Figure 20.2; also refer to Figure 14.10):

- Planned expansion of northern Gai Kodzor in areas free from existing structures that are within the existing boundaries of the village (approximately 4.5 km northeast of the landfall facilities);
- The low-rise residential development in the central, western and southern parts of Supsekh making use of undeveloped land within the settlement and 39 hectares of agricultural land (located approximately 3.5 km northwest of the Pipeline). The development may also include new secondary education schools, kindergartens, district hospital, out-patient clinic, emergency medical service department, fire station, shopping and routine services facilities and sports facilities;
- The allocation of shopping, public catering and roadside service facilities along the Anapa to Sukko motorway on the southern outskirts of the village of Supsekh;
- Development in the southern part Varvarovka. The design includes a low-rise residential estate, a kindergarten, a clinic and a new motorway to start in the region of the Supsekh cemetery and run parallel to the coastline, along Marusenkov Gaping to the Anapa to Sukko motorway; and
- Development of Sukko within the undeveloped areas within the existing village, including residential areas in the valley on the right bank of the Sukko River, in the central part of the village and to the south of Gornay Street (approximately 2.55 km southeast of the Project). The development proposals also include a school, kindergarten, medical clinic, centre for spa services, and the construction of a waterfront pedestrian area with parks and landscaping along the Sukko River, plus construction of a 3 km beach strip with waterfront facilities and relevant infrastructure (existing beach length is approximately 650 m long).

Varvarovka

Sukko

A

B

C

D

E

F

G

0 500 1,000 1,500 m

N

LEGEND

Proposed residential development

A - The Clearing in the Woods ("Lesnaya Polyana") development
B - The Residence Of Utrish development
C - The Zapovedny (Reserved) development
D - Resort-Residential District "Anapolis"
E - Children's Entertainment Park
F - Resort-Residential District "Gornoye Ozero"
G - "Chateau" development

Russian Sector of South Stream Offshore Pipeline

Proposed landfall section pipelines
Landfall facilities
Proposed microtunnels
Proposed offshore pipelines
Microtunnel entry shaft
Microtunnel exit pit

United Gas Supply System

Russkaya compressor station
United Gas Supply System pipelines

Projection: Lambert Conformal Conic

Revision Details	By / Check	Check Date	Suffix

Purpose of Issue: For Information

Client: South Stream Offshore Pipeline — ENERGISING EUROPE

Project Title: SOUTH STREAM OFFSHORE PIPELINE

Drawing Title: LOCATION OF KNOWN AND POTENTIAL DEVELOPMENTS IN THE VICINITY OF THE PROJECT

Drawn	Checked	Approved	Date
AH	RW	MW	24 Feb 2014

URS Internal Project No.	Scale @ A3
46369082	1:25,000

URS Infrastructure & Environment UK Limited
Scott House
Alençon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
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www.ursglobal.com

Drawing Number: Figure 20.1

Rev:

Plot Date: 24 Feb 2014
File Name:I:\5004 - Information Systems\46369082_South_Stream\MXDs\Report Maps - Russia\Russian ESIA v2\Chapter 20 Cumulative Impacts\Figure 20-1 Location of Known and Potential Developments in the Vicinity of the Project.mxd

Supsekh

Gai Kodzor

Varvarovka

Sukko

0 0.5 1 1.5 2 km

N

LEGEND

- Planned development in southern Varvarovka
- Development in central, western and southern parts of Supsekh
- Development of undeveloped areas within Sukko
- Planned development in southern Varvarovka
- Planned expansion of northern Gai Kodzor
- Services alongside the Anapa to Sukko motorway

Russian Sector of South Stream Offshore Pipeline

- Proposed landfall section pipelines
- Landfall facilities
- Proposed microtunnels
- Proposed offshore pipelines
- Right-of-Way
- Microtunnel entry shaft
- Microtunnel exit pit
- Permanent access road to be constructed by SSTTBV
- Varvarovka bypass road (used by Project during construction only)

United Gas Supply System

- United Gas Supply System pipelines
- Russkaya compressor station
- Permanent access road to be constructed by Gazprom Invest

Projection: Lambert Conformal Conic

Revision Details	By / Check	Check Date	Suffix

Purpose of Issue: For Information

Client: South Stream Offshore Pipeline — ENERGISING EUROPE

Project Title: SOUTH STREAM OFFSHORE PIPELINE

Drawing Title: DEVELOPMENTS INCLUDED IN THE ANAPA DISTRICT GROWTH DEVELOPMENT PLAN

Drawn	Checked	Approved	Date
AH	RW	MW	24 Feb 2014

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46369082	1:37,000

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Drawing Number: Figure 20.2

Rev:

Plot Date: 24 Feb 2014
File Name:I:\5004 - Information Systems\46369082_South_Stream\MXDs\Report Maps - Russia\Russian ESIA v2\Chapter 20 Cumulative Impacts\Figure 20-2 Developments included in the Anapa District Growth Development Plan.mxd

Temryuksko
- Akhtarsky

Ukrainian EEZ

Russian EEZ

Novoye

Anapa

Novorossiysk

-100
-200
-500
-1000
-1500
-2000
-50
-500

Ukrainian EEZ

West
Chernomorsky
Area

Tuapse
Trough

South
Chernomorsky
Area

Russian EEZ

Turkish EEZ

0 20 40 60 80 100 km

N

LEGEND

- Licence Block
- Field
- Proposed offshore pipelines
- Exclusive Economic Zone boundary
- Isobaths

Projection: Lambert Conformal Conic

Revision Details	By / Check	Check Date	Suffix

Purpose of Issue: For Information

Client: South Stream Offshore Pipeline — ENERGISING EUROPE

Project Title: SOUTH STREAM OFFSHORE PIPELINE

Drawing Title: INDICATIVE ROSNEFT OIL LICENSE BLOCKS IN THE VICINITY OF THE PROJECT

Drawn	Checked	Approved	Date
DH	RW	MW	24 Feb 2014

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Drawing Number: Figure 20.3

Rev:

20.6.3 Development Proposal CIA Analysis

Section 20.6.2 above defines the planned and reasonably foreseeable or defined development proposals in the vicinity of the Project. An analysis has been undertaken of development proposal features (programme, distance from the Project activities, development footprint characteristics) in order to ascertain the Project's potential to contribute to a cumulative impact during its Construction and Pre-Commissioning and Operational Phases. This analysis is presented in Table 20.3 and details which development proposals have been scoped in and out of the CIA (i.e. developments scoped out of the assessment are considered to not have the ability to generate a significant cumulative impact as associated with the Project) or where development proposals have a high degree of uncertainty or are undefined such that the potential for cumulative impacts cannot be appropriately assessed.

On the basis of the development cumulative impact analysis as detailed in Table 20.3, the following developments have been scoped into the CIA[3]:

- Russkaya CS and associated pipelines;
- Lesnaya Polyana;
- Club Village Chateau; and
- Anapolis mixed use development.

Other developments have been scoped out of the CIA on the basis that:

- The temporal or spatial interactions with the Project are such that significant adverse cumulative impacts would be avoided;
- The development proposals are only at the conceptual stage; or
- There is lack of information available to undertake a meaningful assessment.

[3] The Lesnaya Polyana, Club Village Chateau, and the Anapolis mixed use developments are all being progressed by Fund Yug properties.

Table 20.3 Project Cumulative Impact Analysis of Development Projects

Development	Interaction with Project	Scoped In / Out of CIA
South Stream Pipeline – Turkey	Construction works will be taking place within Russian waters and Turkish waters at the same time, and thus the potential for concurrent activities to generate a cumulative impact needs to be considered (potential transboundary impacts are discussed in **Chapter 21 Transboundary Impact Assessment**). Based on the current Project programme, construction activities will be taking place in Russian and Turkish waters at the same time for a duration of approximately 171 days. The construction spreads in Turkey and Russia will be travelling at the same speed, whilst there will be at least 470 km between these spreads at any given time. Given this distance between the construction spreads and given the limited range of impacts that are associated with the works (such as underwater noise impacts upon marine mammals and fish), it is considered that concurrent activities within Turkey and Russian offshore areas will not be able to generate any significant cumulative impacts. Similarly any concurrent Operational Phase maintenance activities taking place are not anticipated to generate any significant cumulative impacts.	Scoped out

Continued...

Development	Interaction with Project	Scoped In / Out of CIA
Russkaya CS (see Figure 20.1)	The Project landfall facilities will be connected to the upstream pipeline network which forms part of the Expansion of the UGS and includes the Russkaya CS. Some construction activities will occur at the same time as Project construction works. The Russkaya CS development thus interacts with the Project both spatially and temporally. Given that the Russkaya CS and the four connecting pipelines have been defined as associated facilities, there is a need to consider the Russkaya CS development's potential environmental and social implications given that such impacts will be additional to the impacts Project impacts (and as reported within the ESIA technical assessment chapters). In addition to the discussion on cumulative impacts as presented herein, Appendix 20.1 provides details of the Russkaya CS environmental impacts as reported in the development EIA (Ref. 20.3 and Ref. 20.4). Thereafter the appendix presents an appraisal of potential combined impacts of the Russkaya CS plus the Project. This combined appraisal has a different focus to the CIA – namely the CIA focuses on the risks of concurrent Project and Russkaya CS (and other developments scoped into the CIA) activities generating cumulative impacts upon sensitive receptors (VECs) that are common to both developments, whereas the collective appraisal considers the potential impacts of the Project and the Russkaya CS development (as though this were one development) upon sensitive receptors (during construction and operational phases).	Scoped in
Rosneft Oil Exploration Licenses (see Figure 20.3)	As illustrated in Figure 20.3, the Project offshore pipelines pass through the Rosneft exploration blocks at Tuapse Trough and West Chernomorsky. As detailed in Section 20.6.2.3, specific details regarding Rosneft exploration proposals are not currently available. It is not possible to undertake a meaningful cumulative impact assessment due to a lack of available information. South Stream Transport will seek to further liaise with Rosneft with the aim of minimising the potential for any cumulative marine environmental impacts that might result from any simultaneous activities.	Scoped out (due to lack of available information)

Continued…

Development	Interaction with Project	Scoped In / Out of CIA
Lesnaya Polyana development (see Figure 20.1 development A)	This residential development is currently under construction and will extend the town of Varvarovka towards the Project. The development site is located approximately 500 m northwest of the microtunnel entry points and approximately 1.5 km southwest of the landfall facilities. If construction of this residential development is part-complete by the time the Project construction works start, the development residents would be sensitive receptors, and have been considered as such where relevant within this ESIA. Construction activities could be concurrent with those of the Project. Given the location of the development and potential for construction activities to be concurrent with those of the Project, this development has been scoped into the CIA.	Scoped in
Utrish development (see Figure 20.1 development B)	The proposed development site is highly modified and is located in the north-western urban fringe of Sukko (located approximately 2.55 km southeast of the microtunnelling point). The urban nature of the proposed development site, and the degree of separation between the development site and the Project, indicates that there is very little scope for any potential significant cumulative impacts upon area VECs. As such, this proposed development has been scoped out of the CIA.	Scoped out (but considered within the landscape and visual impact)
Zapovedny development (see Figure 20.1 development C)	The proposed development site is highly modified and is located in the southern urban fringe of Sukko (located approximately 3.5 km east-southeast of the Project). The urban nature of the proposed development site, and the degree of separation between the development site and the Project, indicates that there is very little scope for any potential significant cumulative impacts upon area VECs. As such, this proposed development has been scoped out of the CIA.	Scoped out (but considered within the landscape and visual impact)

Continued...

Development	Interaction with Project	Scoped In / Out of CIA
Other developments in eastern Sukko (see Figure 20.1 developments E and F)	The programme for these potential developments is uncertain, although it is considered most likely that if developed, they would be constructed after the Project Construction Phase. These proposed development sites are high modified and located on the urban fringe of Sukko (located at least approximately 3 km east-southeast of the Project). The modified nature of the proposed development sites, the uncertain nature of when they are to be developed, and the degree of separation between the development sites and the Project, indicates that there is very little scope for any potential significant cumulative impacts upon area VECs. As such, these proposed developments have been scoped out of the CIA.	Scoped out (but considered within the landscape and visual impact)
Club Village Chateau development (see Figure 20.1 development G)	The proposed development involves the construction of approximately 45 chateaus within an area of existing vineyards. This development covers an area of approximately 83 ha (located approximately 200 m to the northeast of the Landfall Facilities), although construction works are estimated to impact upon an area of approximately 16.6 ha (with the remaining area of vineyards being unaffected). It is understood that the development is on hold and will only proceed following completion of the Project Construction Phase given that the road which passes through the development plot will be used as a Project access road. Given the location of the development, this development has been scoped into the CIA, although the development programme indicates that Construction Phase cumulative impacts will be avoided.	Scoped in
Anapolis development (see Figure 20.1 development D)	This proposed mixed use development covers an area of approximately 66.7 hectares and is located approximately 350 m south of the Pipeline alignment. The construction phase for this development may start within 2014. Given the location of the development, this development has been scoped into the CIA.	Scoped in

Continued…

Development	Interaction with Project	Scoped In / Out of CIA
Anapa District GDP (see Figure 20.2 and Figure 14.10)	These proposed developments are at the conceptual planning stage and thus there is little information available regarding the development details (e.g. development footprints) and their associated construction programmes. It is, however, considered most likely that these areas would only be developed after completion of Project construction activities. Given the nature of these proposed developments, their degree of separation from the Project, and the conceptual nature of such proposals (meaning that there is a lack of information available to assess the potential for cumulative impacts), these development proposals have been scoped out of the CIA.	Scoped out

Complete.

20.7 CIA and Significance Assessment

Section 20.5.3 defined the VECs and associated impact sources that need to be considered as part of the CIA, namely the following:

- Construction Phase impacts upon the prevailing landscape character and visually sensitive human receptors;
- Reduced residential amenity for residents in local communities, specifically north east Varvarovka, during the Construction and Pre-Commissioning Phase due to potential combined noise and visual impacts;
- Construction Phase impacts upon discrete marine cultural heritage resources; and
- Waste disposal of material at the Alfa Landfill.

Section 20.6.3 identified the developments that have the potential to interact with the Project (spatially and / or temporally) in a manner that could result in significant cumulative impacts (additive, interactive or spin-off impacts as per Section 20.2).

The sections below consider the potential for VECs to experience potential cumulative impacts, focusing in particular upon the VECs and associated impact sources highlighted in the bullet points above. In addition, the sections below also consider some VECs which experience a Not Significant or Low Adverse residual impact (as detailed in Table 20.2) where the potential for cumulative impacts warrants further consideration due to the sensitivity / importance of affected VECs. To assist with this process, the various development projects included in Section 20.6 have been considered, together with VEC residual impact levels as indicated in Table 20.2 and VEC location. Table 20.4 summarises the results from this analysis and indicates which developments have been considered by the various VEC-specific cumulative impact assessments.

The potential for cumulative traffic and transportation impacts has also been considered. Whilst traffic is not a defined VEC, traffic flow changes have the ability to impact upon VECs i.e. human receptors that are being considered within this CIA.

In the sections below, if a cumulative impact risk is identified, the significance of the potential cumulative impact is either quantified or qualified (depending upon data availability).

Table 20.4 Developments Considered by Each VEC Cumulative Assessment

Project VECs	Russkaya CS	Lesnaya Polyana	Club Village Chateau	Anapolis Development	Rosneft Oil and Gas Exploration Activities	Utrish Dev-elopment	Zapovedny (Reserved) Development	Developments in Eastern Sukko	Anapa District GDP
Soils, Surface Water and Groundwater	✓	✓	✓	✓					
Air Quality	✓ Construction phase only	✓ Construction phase only	✓ Construction phase only	✓ Construction phase only					
Noise and Vibration	✓ Construction phase only								
Terrestrial Ecology	✓	✓	✓	✓					
Marine Ecology									
Landscape and Visual	✓	✓	✓	✓		✓	✓	✓	

Continued...

Project VECs	Russkaya CS	Lesnaya Polyana	Club Village Chateau	Anapolis Development	Rosneft Oil and Gas Exploration Activities	Utrish Dev-elopment	Zapovedny (Reserved) Development	Developments in Eastern Sukko	Anapa District GDP
Socio-economics	✓	✓	✓	✓					
Ecosystem Services	✓	✓	✓	✓					
Cultural Heritage – Terrestrial	✓								
Cultural Heritage - Marine									
Waste Management	✓								

✓ indicates developments scoped in

Complete.

20.7.1 Soil, Groundwater and Surface Water

Chapter 8 Soil, Groundwater and Surface Water (summarised in Table 20.2) reports that the residual impacts upon soils, surface water and groundwater are predicted to be either **Not Significant** or **Low Adverse** during all Project phases, with impacts generally being local to the Project site and its immediate surrounds. This indicates that the Project's ability to contribute to a soils, surface water and groundwater cumulative impact with other potential developments scoped into the CIA is very limited.

20.7.1.1 Russkaya CS Development

The sections below consider the potential for cumulative soils, surface water and groundwater impacts of the Project and the Russkaya CS (and associated pipelines) as this represents the scenario with the greatest risk of generating a potential cumulative impact upon these resources:

- **Soils:** A number of Low Adverse impacts have been identified during the Construction and Pre-Commissioning Phases on Agricultural, Fluvisol and Phaeozem soils (due to activities such as the storage and use of potentially polluting materials; vegetation clearance which increases soil susceptibility to erosion; earth moving activities increasing the risk of slope failures / soil movement / subsidence / slope erosion and soil compaction); loss of soil by excavations) (**Chapter 8 Soil, Groundwater and Surface Water**).

  The Russkaya CS construction activities have the potential to impact upon the same soil types as those impacted by the Project. The Russkaya CS EIA Report (Ref. 20.3 and Ref. 20.4) highlights that a range of mitigation measures will be applied to reduce impacts upon soil resources. Whilst the Russkaya CS development and the Project both have the potential to impact upon soil resources, both will adopt a range of mitigation measures to limit the impacts associated with land clearance and earthworks, accidental leakages and spillages. In addition, the areas collectively impacted are also spatially limited to the development footprints, which are small when compared to the regional soil resource. On this basis, no significant cumulative impacts on area soil resources are anticipated with respect to the concurrent development of the Russkaya CS and the Project.

  No significant cumulative impacts on soils are anticipated during the Operational Phase given that all Project impacts are predicted to be **Not Significant**;

- **Groundwater:** the assessment presented in **Chapter 8 Soil, Groundwater and Surface Water** indicates a **Low** Adverse residual impact upon the superficial aquifer and carbonate aquifer both during the Construction and Pre-Commissioning Phase and the Operational Phase. Impacts potentially arise due to the storage and use of potentially polluting materials; leaks of seawater from the Pipeline to groundwater during hydro-testing and groundwater quality impacts during microtunnelling.

  The Russkaya CS development is located over the same aquifer system as the Project. With the exception of using water supply wells, the construction activities for the Russkaya CS development are similar to the Project. The Russkaya CS EIA Report (Ref. 20.3 and Ref. 20.4) highlights that a range of mitigation measures will be applied to reduce impacts upon groundwater resources.

Whilst the Russkaya CS and the Project both have the potential to impact upon the area's groundwater resources, they will adopt a range of mitigation measures to limit the impacts associated with wastewater management and disposal, stormwater management and the disposal and accidental leakages and spillages. The area that could be collectively impacted is small relative to the entire carbonate aquifer. On this basis, no significant cumulative impacts on the area's groundwater resource are anticipated. Given the distance of over 5 km between the Project and the Russkaya CS water supply wells, a cumulative impact upon groundwater resources is not anticipated during the Project Operational Phase; and

- **Surface Waters:** the assessment presented in **Chapter 8 Soil, Groundwater and Surface Water** indicates **Not Significant / Low** Adverse residual impacts upon a number of surface water features, namely the Shingar River, a tributary in the Graphova Gap, and an existing surface water abstraction during both the Construction and Pre-Commissioning Phase and the Operational Phase.

  The Russkaya CS development pipeline section is partly located within the same surface water catchment (the tributary in the Graphova Gap) as the majority of the Project. The construction activities for the Russkaya CS development are similar to the Project. The Russkaya CS development has the potential to impact upon surface waters in the Project Area only during periods when the watercourses are flowing and may impact upon the downstream stretches of the tributary in the Graphova Gap. The Russkaya CS EIA Report (Ref. 20.3 and Ref. 20.4) highlights that a range of mitigation measures will be applied to reduce impacts upon surface water resources.

  The Russkaya CS and the Project will both adopt a range of mitigation measures to limit the impacts associated with activities such as land clearance, earthworks, open-cut river crossings, wastewater management and disposal, storm water management and disposal and accidental leakages and spillages.

  Overall it is considered that there is a potential for low significance cumulative impacts on surface water resources. However, any such impacts would be temporary due to the ephemeral nature of the watercourses in the catchment and the temporary duration of development activities.

  Significant cumulative impacts upon surface water during the Operational Phase are not anticipated given that the Russkaya CS and the Project will both adopt a range of mitigation measures to limit the impacts associated with the presence of the technical facilities and access roads, accidental leakages and spillages, and on-going vegetation control along the RoWs of the respective pipelines.

20.7.1.2 Lesnaya Polyana, Club Village Chateau and Anapolis Developments

The potential for cumulative soils, surface water and groundwater impacts as associated with the Lesnaya Polyana, Club Village Chateau and Anapolis developments are considered in the sections below:

- **Lesnaya Polyana:** given the nature and scale of the development (16.5 ha), its location on highly modified land on the outskirts of Varvarovka, and given that it is understood that site levelling has already been carried out, cumulative soil, surface water and groundwater

impacts are not anticipated during the Project Construction Phase. This is particularly the case if the development construction works are completed prior to Project development.

During the Project Operational Phase, the Lesnaya Polyana development is not anticipated to generate any cumulative soil, surface water and groundwater impacts given the residential nature of the development (without any significant soil, surface water and groundwater impact sources). Whilst the source of water supply to the development is uncertain, it is assumed that the use of any water supply wells will be undertaken in compliance with local regulatory authority requirements in a manner that does not adversely impact upon groundwater resources;

- **Club Village Chateau:** soil, surface water and groundwater impacts during the Project Construction Phase would be avoided given that it is understood that the Club Village Chateau development will be delayed until after completion of Project construction activities (given that the road which passes through the development plot will be used as a Project access road).

  During the Project Operational Phase, construction and then use of the Club Village Chateau development is not anticipated to generate any cumulative soil, surface water and groundwater impacts given the disturbed nature of the site and the semi-rural residential nature of the development (without any significant soil, surface water and groundwater impact sources). Whilst the source of water supply to the development is uncertain, it is assumed that the use of any water supply wells will be undertaken in compliance with local regulatory authority requirements in a manner that does not adversely impact upon groundwater resources; and

- **Anapolis Development:** it is currently uncertain if this Anapolis development's construction phase will coincide with the Project Construction Phase. If such works were to coincide, it is considered that given the nature of the Anapolis development, and given the mitigation measures to be employed by the Project, that significant cumulative soil, surface water and groundwater impacts will be avoided.

  During the Project Operational phase, use of the Anapolis development is not anticipated to generate any cumulative soil, surface water and groundwater impacts given the mixed use residential nature of the development (without any significant soil, surface water and groundwater impact sources). Whilst the source of water supply to the development is uncertain, it is assumed that the use of any water supply wells will be undertaken in compliance with local regulatory authority requirements in a manner that does not adversely impact upon groundwater resources.

20.7.2 Air Quality

Chapter 9 Air Quality (as summarised in Table 20.2) reports that the residual air quality impacts upon human and ecological VECs are all predicted to be either Not Significant or **Low Adverse** during all Project phases. This indicates that the Project has limited potential to contribute to an air quality cumulative impact when considering the other developments scoped into the CIA. Nevertheless, the sections below discuss potential cumulative air quality issues during the Construction and Pre-Commissioning Phase taking into account the construction of

the Russkaya CS development as well as construction of other potential developments in the vicinity of the Project (see Table 20.4).

20.7.2.1 Russkaya CS Development

Construction and Pre-Commissioning Phase

The sections below consider the potential for dust and nitrogen dioxide related cumulative impacts from concurrent construction of the Russkaya CS and the Project.

The EIA for the Russkaya CS (Ref. 20.3 and 20.4) does not quantify dust emissions from construction equipment and vehicles. However, most dust including the finer particulates, is anticipated to be deposited within approximately 1 km of an emission source – as such, dust from the Russkaya CS construction works are unlikely to affect Gai Kodzor, which is the nearest populated area (located approximately 1.6 km north of the Russkaya CS construction site). Given that the Project would not result in any dust related impacts upon Gai Kodzor a dust related cumulative impact would be avoided at these residential receptors. Similarly, no other VECs are anticipated to experience a dust related cumulative impact.

The greatest air quality impact from the construction of the Russkaya CS and associated pipeline is on nitrogen dioxide (NO_2) concentrations. The Russkaya CS EIA (Ref. 20.3 and 20.4) has assessed the impact of its construction phase activities on 20 minute Maximum Permissible Concentration (MPC) nitrogen dioxide concentrations. Concentrations are predicted to increase at Gai Kodzor from the current level, which is approximately 25% of the national regulatory limit, to 33% of the regulatory limit.

The receptors most likely to be affected by potential cumulative construction impacts as associated with the Russkaya CS and the Project are as follows (refer to Figure 9.4 in **Chapter 9 Air Quality** for receptor locations):

- Receptor 5 (Lesnaya Polyana) – Most affected by the Project Construction Phase. The southern boundary of a proposed residential development currently under construction lies approximately 500 m northwest of the microtunnel entry points and 1.5 km southwest of the landfall facilities; and
- Receptor 10 (Gai Kodzor) – Most affected by the construction of the Russkaya CS. The southern edge of the nearby town Gai Kodzor lies approximately 4.5 km northeast of the landfall facilities.

The construction of the Russkaya CS pipeline from the compressor station to the landfall facilities could occur simultaneously with the laying of the Project Pipeline. If the works were to occur simultaneously, the theoretical combined impact of the two construction operations is provided in Table 20.5.

Table 20.5 Assessment of Potential Cumulative Construction Impacts on MPC NO_2 Concentrations

Receptor	South Stream Construction Impact (% MPC)	Russkaya CS Construction Impact (% MPC)	Combined Impact (% MPC)	Impact Significance
Receptor 5	65	2	67	Low Significance
Receptor 10	28	8	36	Not Significant

Table 20.5 illustrates that the national (and Project Standard) requirement that concentrations should not exceed 0.8 of the MPC would be satisfied at both receptors (see **Chapter 9 Air Quality** for more details). Taking background concentrations into account, the total MPC concentration would be 71% of the MPC at Receptor 5 and therefore below the national requirement.

As described in **Chapter 9 Air Quality**, an impact of the magnitude predicted at Varvarovka (Receptor 5) is more than 50% of the short term standard of 200 $\mu g/m^3$ and as such is categorised as a high magnitude impact. As this impact would occur in an area containing receptors of 'negligible' sensitivity (residential properties outside of urban centres), it can be regarded as an impact of Low Adverse significance (with the Russkaya CS construction works making an insignificant contribution to this impact). At Gai Kodzor, the impact is less than 50% of the short term limit. This is categorised as a moderate magnitude impact (on a low sensitivity receptor), and can be regarded as being **Not Significant**.

The analysis above indicates that concurrent construction of the Russkaya CS and the Project would not result in a significant cumulative nitrogen dioxide MPC impact. Furthermore this cumulative assessment is based on unfavourable meteorological conditions, and thus the analysis represents an improbable very worst case. Similarly, receptors located further from the two developments are not predicted to experience a cumulative nitrogen dioxide impact during the Construction and Pre-Commissioning Phase.

20.7.2.2 Lesnaya Polyana and Anapolis Developments

The Lesnaya Polyana and the Anapolis developments have the potential to generate airborne dust, emit atmospheric emissions associated with the site plant, and generate additional truck movements if they are constructed at the same time as the Project construction activities. However, these impacts are likely to be localised and short-term in nature. Dust and site plant emissions are likely to only be an issue in the immediate vicinity of these sites (with the majority of the construction generated dust depositing within 100 m), and hence should not contribute to a cumulative air quality impact when considered with the Project.

For the Lesnaya Polyana development, construction is already underway and, despite being unlikely, could be complete and fully occupied in advance of construction starting on the Project. This would essentially eliminate the potential for air quality related cumulative impacts.

Recognising it might be completed and occupied, the Lesnaya Polyana development has already been considered as a sensitive receptor in the air quality impact assessment (Receptor 5), which concluded that this receptor would experience a **Not Significant** dust impact during the Construction Phase of the Project. Given the dust generated by the Lesnaya Polyana and Anapolis developments is expected to be localised and that the Project's impact on Lesnaya Polyana has been assessed as **Not Significant**, the cumulative impacts associated with construction dust and site plant emissions are therefore also expected to remain **Not Significant**.

The effect on air quality from traffic generation associated with these residential schemes during their construction is expected to be relatively minor, as such traffic is likely to be well distributed across the regional road network. The assessment of road traffic emissions for the Project showed that construction road traffic contributes relatively little to pollutant concentrations along the two key transport routes for the Project, and that the Project would have a negligible magnitude impact upon air quality. On the basis that the marginal increase in traffic flow along these routes is not expected to result in a discernible increase in the pollutant levels, the cumulative impact for air quality is expected to remain **Not Significant**.

20.7.2.3 Club Village Chateau

Whilst the Club Village Chateau development has the potential to generate airborne dust and emit atmospheric emissions as associated with the site plant, and generate additional truck movements, this development will not take place until after completion of Project construction activities. As such, cumulative construction air quality impacts would be avoided.

20.7.3 Noise and Vibration

An assessment of the worst case noise and vibration impacts associated with Project construction has been undertaken which indicates that noise and vibration impacts will generally be **Not Significant** at all existing sensitive receptors neighbouring the Project. As such the Project has limited potential to contribute to a cumulative noise and vibration impact in combination with the other developments scoped into the CIA.

Whilst it is considered that the Project has a very limited potential to contribute to cumulative noise and vibration impacts with the Russkaya CS (due to residual impact magnitudes largely being of negligible magnitude), the sections below test this hypothesis by considering the potential cumulative noise impacts of the Project and the Russkaya CS (and associated pipelines) assuming that both construction programmes occur simultaneously. This represents the scenario with the greatest risk of generating a potential cumulative noise and vibration impact.

The closest noise sensitive residential receptors, and hence the receptors likely to be affected by worst case noise levels generated by concurrent Project and Russkaya CS construction activities, are as follows (refer to Figure 10.2 in Chapter 10 for receptor locations):

- Receptor 3 - A residential dwelling situated in the north-eastern part of Varvarovka, approximately 1.4 km north of the landfall facilities;

- Receptor 4 - A residential dwelling situated in the north-eastern part of Varvarovka, approximately 1.5 km north of the landfall facilities; and
- Receptor 8 - Two log cabins that have recently been built on cleared land, approximately 1.3 km south of the landfall facilities.

The construction of the Russkaya CS pipeline from the compressor station to the landfall facilities could occur simultaneously with the laying of the Project Pipeline. An assessment of the worst case construction noise impacts is summarised in Table 20.6, taking the highest predicted construction noise at identified receptor locations.

Table 20.6 Assessment of Cumulative Construction Impacts

Receptor	South Stream Construction Noise Level (dB(A))	Russkaya CS Construction Noise Level (dB(A))	Worst Case Cumulative Noise Level (dB(A))	Russian Noise Limit (dB(A))	Impact Significance
Receptor 3	40	19	40	55	Not Significant
Receptor 4	50	21	50	55	Low Adverse
Receptor 8	40	22	40	55	Not Significant

Table 20.6 indicates that the noise generated by concurrent construction of the Project and the Russkaya CS will have an impact of **Low Adverse** significance at the most exposed receptor (Receptor 4). However, the predicted noise level and therefore impact significance is the same as for the Project only scenario as detailed in **Chapter 10 Noise and Vibration** and thus the Russkaya CS construction works are not causing an additional noise impact at Receptor 4. At receptors 3 and 8, the significance of the noise impact is **Not Significant**. As the daytime noise limit of 55 dB(A) as given in the Russian Federation regulations (and IFC[4]) will not be exceeded at any of these receptors, it is considered that all these noise impacts are acceptable.

The analysis above indicates that concurrent construction of the Project and the Russkaya CS facilities will not result in a significant cumulative noise impact at locations exposed to both developments.

20.7.4 Terrestrial Ecology

Section 20.5.3 indicated that residual terrestrial ecological impacts associated with Project induced habitat loss will be **Not Significant** or of **Low Adverse** significance, which indicates that the Project's ability to contribute to a cumulative terrestrial ecological impact, when considering the other developments scoped into the CIA, is very limited and can thus be scoped

[4] The Russian Regulations provide a more stringent approach to the limiting of noise than that given in the IFC General EHS Guidelines as there is no allowance for elevated noise levels where the prevailing ambient noise climate is already over the prescribed noise limit – refer to **Chapter 10 Noise and Vibration**.

out of the CIA. However, given the ecological sensitivity of the area in the vicinity of the Project, the sections below consider the potential for cumulative ecological impacts as a result of the other development scoped into the CIA (see Table 20.4).

20.7.4.1 Russkaya Compressor Station (CS)

The Russkaya CS development (Ref. 20.3 and Ref. 20.4) comprises three components of interest to this cumulative impact assessment: the compressor station, the four pipelines (referred to hereafter as the Russkaya CS Right of Way (RoW) running from the compressor station to the Project's landfall facility, and a permanent access road which runs from near the town of Varvarovka, eastward across the Graphova Gap, past the Project's landfall facilities to the safety valve station of the Russkaya CS development (the 'Gazprom Invest permanent access road' - see **Chapter 5 Project Description** for the location of this permanent access road).

The Russkaya CS EIA Report (Ref. 20.3 and Ref. 20.4) has been reviewed in order to determine if significant cumulative effects between the Project and Russkaya CS are likely. The report presents the terrestrial ecology baseline for the Russkaya CS development and presents an assessment of the likely effect of the development on terrestrial ecology receptors.

To supplement the information contained within the Russkaya CS EIA, a walkover survey of the Russkaya CS RoW was undertaken in June 2013 in conjunction with ecology surveys for the Project (see Section 11.4.4.1). That walkover survey mapped vegetation to a distance of 100 m either side of the Russkaya CS RoW centreline and recorded incidental sightings of Red Data Book (RDB) species.

The paragraphs below present a receptor-based assessment of the potential for significant cumulative impacts resulting from combined impacts of the Russkaya CS and the Project. This assessment is based on this ESIA for the Project, on the information described in the Russkaya CS EIA, and on the June 2013 walkover survey data.

Habitats and Flora

Surveys for the Russkaya CS EIA recorded woodland, meadow, and anthropogenic habitats (including agricultural land). The 2013 walkover survey classified these habitats and recorded their extent and distribution within 100 m of the Russkaya CS RoW centreline. Habitats recorded included shiblyak, mesophilic forest, juniper woodland, secondary steppefied meadow, mesophilic meadow, and agricultural habitats.

The Russkaya CS EIA reports that the impact of construction of the Russkaya CS on these habitats will directly (through habitat loss) and indirectly (degradation) affect areas of both natural and modified habitats, including large swathes of woodland (predominantly shiblyak) habitat. The area of habitat loss is not, however, quantified within the Russkaya CS EIA.

For the purpose of this CIA, and to provide an indication of the area likely to be directly affected by the Russkaya CS RoW, a 120 m wide construction corridor has been assumed which equates to a construction area of approximately 38.7 ha. Based on available information, the footprint of the compressor station is approximately 52 ha, whilst the construction footprint for the Gazprom Invest permanent access road is estimated to be approximately 4.5 ha and an area of approximately 16.1 ha will be required as a temporary construction works area. The total

construction footprint of the Russkaya CS development is thus assessed to be approximately 111.3 ha (see Section 20.6.2.2).

Table 20.7 presents a comparison of the direct habitat loss occurring as a result of the Project compared to that as a result of the Russkaya CS RoW. The habitat type for the footprint of the compressor station is given as "unknown" because this is not described in the Russkaya CS EIA, and the South Stream Transport 2013 survey was unable to survey the compressor station footprint as construction had already started; however, satellite imagery suggests that the dominant habitat types may have been agricultural, meadow, and forest.

Table 20.7 Comparative Direct Habitat Loss Between the Project and the Russkaya CS

Habitat Type	Project Direct Habitat Loss (ha)	Russkaya CS Direct Habitat Loss (ha)
Shiblyak	3.5	57
Juniper woodlands	2.6	5.3
Mesophilic forest	1.4	5.4
Steppefied secondary meadow	4.1	21.3
Mesophilic meadow	0	0.4
Agricultural habitats	53.5	21.9
Total	**65.1**	**111.3**

The Russkaya CS EIA proposes control measures to avoid impacts to habitats, and proposes mitigation measures aimed at replacing lost habitat; measures are described to avoid pollution and degradation to habitats, and habitat creation and compensatory planting measures (where possible). It is not, however, clear within the Russkaya CS EIA whether the mitigation measures proposed will reduce residual impacts on ecological receptors to not significant levels.

Construction of both the Russkaya CS and the Project will result in the loss of ecologically valuable habitats (see Table 20.7). The residual impact for habitat loss for the Project are anticipated to be **Not Significant** due to the provision of mitigation measures to safeguard habitats during construction, and where significant impacts occur, to implement habitat reinstatement and creation. This includes provision for a Biodiversity Action Plan (BAP) which will aim to achieve no net loss of biodiversity, and in the case of a component of Critical Habitat (such as mesophilic forest), a net gain.

Accordingly, the Project is not anticipated to significantly contribute to cumulative impacts with the Russkaya CS. There is, however, an opportunity to enhance the benefits to biodiversity management if the Project's mitigation measures were extended to encompass the wider area. South Stream Transport will therefore seek to engage with Gazprom Invest with an aim to align

Gazprom Invest's mitigation measures with those of the Project, where practicable. Furthermore, in developing their BAP, South Stream Transport will seek to engage with Gazprom Invest with an aim to develop measures that would enhance biodiversity management within the wider area.

Fauna

The Russkaya CS EIA recognises that habitat loss and degradation have the potential to adversely affect terrestrial fauna, including herpetiles (such as the RDB species Nikolski's tortoise), mammals (including bats), and birds (including breeding and migratory species). The Russkaya CS EIA does not, however, quantify this loss or ascribe a clear significance to this loss.

The walkover survey of the Russkaya CS RoW conducted by South Stream Transport in 2013 identified very similar habitat types to those recorded within the Landfall Study Area (although, generally speaking, of a greater extent - see Table 20.7). It is therefore likely that the assemblage of species supported by habitats within the Russkaya CS zone of influence is similar to that of the Landfall Study Area, although potentially supporting larger populations considering the larger size of the Russkaya CS footprint.

Based on information contained within the Russkaya CS EIA, and supplementary information gathered by South Stream Transport, predicted impacts of the Russkaya CS development on fauna include the following:

- Direct loss and indirect degradation to habitats (foraging, sheltering, breeding, and hibernation);
- Habitat fragmentation and severance; and
- Potential mortality, injury and disturbance to species supported within these habitats.

These issues are discussed in turn below.

Direct Loss and Indirect Degradation to Habitats

The Russkaya CS EIA proposes measures to avoid and mitigate for habitat loss and degradation - this includes measures for habitat reinstatement and creation, where appropriate. The Russkaya CS EIA also argues that, following construction, additional beneficial effects for some species will be realised (including herpetiles, birds, mammals, and invertebrates), as meadow habitat develops along the previously forested Russkaya CS RoW. Although not clearly reported within the Russkaya CS EIA, it is implied that the long term effect of the loss of habitat for fauna is anticipated to be not significant.

As discussed in **Chapter 11 Terrestrial Ecology**, the Project is not anticipated to significantly reduce the extent or diversity of suitable habitat in the long term, due to the implementation of mitigation measures (including provision of a BAP).

Habitat Fragmentation and Severance

Construction of the Project and the Russkaya CS development, which are anticipated to occur simultaneously, both have the potential to fragment habitat and restrict the movement of

species within the local environment. Habitat fragmentation and severance is likely to occur due to the following elements of both projects:

- Project: Construction of the eastern-most access road, running north-south;
- Project: Construction of the western-most microtunnel access road, running north-south;
- Project: The South Stream Transport RoW and landfall facilities, running generally east-west;
- Russkaya CS: The permanent access road running east-west; and
- Russkaya CS: The Russkaya CS RoW and compressor station, running generally east-west.

Construction of the RoWs of both projects will result in a relatively temporary obstruction (1 – 2 years) to faunal movement. Once construction is completed, the RoWs are not anticipated to limit the movement of species within the landscape. However, the access roads, if permanent, have the potential to disrupt the movement of species (as well as cause mortality due to collisions) in the long term. The species groups that are likely to be affected by habitat fragmentation and severance include herpetiles and non-flying, small mammal species.

Measures to safeguard species from collision-based mortality during construction have been proposed for the Project in this ESIA Report (**Chapter 11 Terrestrial Ecology**). This includes the erection of herpetile and small mammal-proof fencing, which is designed to exclude these species from the construction areas and access roads. Furthermore, it is proposed that the Project install a number of under-road tunnels with the purpose of allowing herpetiles to pass beneath the roads once constructed. Tunnels will be placed at appropriate locations to ensure that there are a sufficient number to mitigate the severance effect.

Measures to reduce the effect of severance (both short- and long-term) and habitat fragmentation are not proposed in the Russkaya CS EIA Report. Although it is not anticipated that the Project's contribution to the cumulative impact of severance will be significant, there is nonetheless the potential for habitat severance within the wider environment to be exacerbated if the Russkaya CS development does not implement appropriate mitigation.

As discussed above, South Stream Transport will engage with Gazprom Invest with an aim to align Gazprom Invest's mitigation measures with those of the Project, where practicable.

Direct Mortality, Injury and Disturbance

There is the potential for both the Project and Russkaya CS to cause direct mortality, injury or disturbance of fauna during construction, including RDB species.

The Russkaya CS EIA proposes measures to avoid impacts on fauna, including control measures to avoid environmental pollution and fires, restrict the extent of construction to only necessary areas, and avoidance of vegetation clearance during sensitive periods; with respect to the latter, the bird breeding season is addressed, although no mention is made of the herpetile hibernation period. In addition, the following measures are proposed in the Russkaya CS EIA Report specifically for RDB species:

- Restriction of spring burns of grass vegetation which might lead to the death of animals;

- Banning of chasing animals, destroying nests and shelters, and illegal shooting;
- Banning keeping tame animals in residential settlements, control on keeping guard dogs on the construction sites; and
- Minimising disturbance in areas adjacent to the construction site.

It is not clear in the Russkaya CS EIA Report whether the proposed mitigation measures will reduce residual impacts of mortality, injury and disturbance on ecological receptors to non-significant levels.

For the purpose of this CIA, an attempt has been made to estimate the number of Nikolski's tortoise with the potential to be directly impacted during construction phases of both projects; this has not been undertaken within the Russkaya CS EIA. This estimate has been based on density figures for the tortoise within the Abrau peninsula, derived from a recent publication (Ref. 20.12). The combined area which is likely to be directly affected by both developments and the extrapolated density value are presented in Table 20.8. It is important to note that these figures are based on the density of tortoises within each habitat type during the species' activity period (approximately April – November) and do not reflect species density during hibernation.

Table 20.8 Number of Nikolski's Tortoise Potentially Present in Areas of Direct Habitat Loss (Combined for Both Developments)

Habitat	Area of Loss5 (ha) (combined for the Project and the Russkaya CS development)	Density of Nikolski's Tortoise/ha	Individuals Potentially Present
Juniper woodlands	7.9	1.95 – 2.85	15.4 – 22.5
Mesophilic forest	6.8	0.1 – 1.6	0.7 – 10.9
Steppefied secondary meadow	25.8	2.21	57
Shiblyak	60.5	0.1 – 1.6	6.1 – 96.8
Unknown (Russkaya CS Footprint)	75.4	Unknown	n/a
Total	**176.4**		**79.2 – 187.2**

This estimate, based on the area of habitat to be directly impacted, should be viewed as the minimum number of tortoises which could potentially be affected by both developments. This does not take into account the range of indirect impacts (disturbance during breeding/hibernation, habitat severance and associated reduced access to resources etc.) which have the potential to affect the wider local tortoise population supported by habitats outside of the development's construction footprint. The number of tortoises affected could, therefore, be significantly higher than the 80 – 188 which have the potential to experience direct effects.

[5] Includes both temporary and permanent habitat loss.

Assuming that the published density figures are applicable to the combined project construction areas, Table 20.8 indicates that removal of various habitat types has the potential to directly affect (through mortality, injury, or direct loss of habitat) 80 - 188 tortoises (noting that the contribution of the Project equates to approximately 19% of the lower range (or 15 of the 80 tortoises) and approximately 13% of the upper range (or 24 of the 188 tortoises). Combined direct habitat losses could thus impact upon approximately 1.1% - 2.7% of the Abrau peninsula's Nikolski's tortoise population (Ref. 20.11), a significant proportion of the regional Nikolski's tortoise population.

The Project will implement various measures to safeguard this species during the Construction Phase (including design controls, appointment of an Ecological Clerk of Works (ECoW), sensitive timing of works, as well as fencing and a programme of capture and placement). These measures, in conjunction with implementation of a BAP, are anticipated to reduce the residual impact of potential Project-related mortality, to **Not Significant** levels. The contribution of the Project to potential cumulative impacts upon herpetiles is, therefore, considered to be **Not Significant**.

Nonetheless, as discussed above, South Stream Transport will engage with Gazprom Invest with an aim to align Gazprom Invest's mitigation measures with those of the Project, where practicable. Of particular importance should be the avoidance of impacts through the sensitive timings of works (including the herpetiles hibernation period), implementation of herpetile fencing and a programme of translocation, and adherence to Good International Industry Practice (GIIP) (see Section **Chapter 11 Terrestrial Ecology**).

20.7.4.2 Lesnaya Polyana

The Lesnaya Polyana development is located approximately 500 m to the north of the Project. The site is located within an area that consists of predominantly agricultural land. It is, however, adjacent to an area of what is likely to be shiblyak woodland. Given the limited extent of the proposed development, and its siting on an area of (predominantly) previously developed land, it is not anticipated that this development would result in a significant ecological impact in combination with the Project.

20.7.4.3 The Anapolis Development

The Anapolis mixed use development covers an area of approximately 65 hectares and is located approximately 350 m south of the Project's microtunnel entry shafts. The construction phase for this development is currently uncertain and no EIA is currently available for review. The cumulative impact assessment has, therefore, been undertaken based on available information regarding the location and extent of the Anapolis development and, as a large proportion of Anapolis falls within the Landfall Study Area, information gathered for the ESIA.

Habitats, Flora and Fauna

Based on information gathered for the ESIA, data on the habitats contained within Anapolis' development footprint is presented within Table 20.9. For illustrative purposes, the area of habitat loss for the Project and Russkaya CS are also presented.

Table 20.9 Comparative Direct Habitat Loss Between the Project, Russkaya CS and Anapolis

Habitat Type	Project's Direct Habitat Loss (ha)	Russkaya CS Direct Habitat Loss (ha)	Anapolis Development Footprint (ha)
Shiblyak	3.5	57	29.3
Juniper woodlands	2.6	5.3	4.3
Mesophilic forest	1.4	5.4	4.5
Steppefied secondary meadow	4.1	21.3	1.4
Mesophilic meadow	0	0.4	1.2
Tomillyar	0	0	0.7
Agricultural habitats / urban areas	53.5	21.9	13.1
Unknown	N/A	N/A	9.4
Total	**65.1**	**111.3**	**64.9**

Information is not available at present on what proportion of the habitats contained within the Anapolis development footprint would be subject to direct loss. There is, however, the potential for the development to result in the direct loss and indirect degradation of relatively large areas of natural habitat.

As a large proportion of Anapolis is located within the Landfall Study Area, it is likely that populations of species which have been recorded during surveys for the Project, including herpetiles, birds, mammals, and invertebrates, will use and be supported by the habitats contained within the Anapolis footprint.

In terms of potential cumulative impacts to fauna, the following impacts are considered key to the CIA:

- Direct loss and indirect degradation to habitats (including foraging, sheltering, breeding, and hibernation habitat for species); and
- Potential mortality, injury and disturbance to species supported within these habitats.

Anapolis is not anticipated to contribute to or exacerbate the impact of habitat fragmentation or severance in combination with the Project.

Cumulative habitat loss within the wider environment is acknowledged as a potentially significant adverse impact if appropriate measures are not taken to mitigate for this loss. The

residual impacts for the Project are anticipated to be **Not Significant**, due to the provision of mitigation measures (including a BAP) which will aim to achieve no net loss of biodiversity and a net gain in Critical Habitat. Accordingly, the Project is not anticipated to make a significant contribution to cumulative impacts with Anapolis or any other cumulative scheme.

However, where there is opportunity to do so, the benefits for biodiversity due to the Project's mitigation measures (e.g. BAP) will be extended to encompass the wider area. South Stream Transport will engage with the Anapolis developers (Fund Yug) with the aim of aligning Anapolis' mitigation measures with those of the Project, developing measures that would enhance biodiversity management within the wider area.

20.7.4.4 Club Village Chateau

As detailed in Section 20.6.2.8, the Club Village Chateau development (see Figure 20.1) involves the development of approximately 45 chateaus within an area of existing vineyards. The development plot covers a total area of approximately 83 ha, although the construction works are estimated to impact upon approximately 20% of the total development footprint (calculated from a review of the proposed development) thus an area of approximately 16.6 ha. It is understood that the development will only proceed following completion of the Project Construction Phase given that the road which passes through the development plot will be used as a Project access road. The Club Village Chateau development is located approximately 250 m and 1,500 m, at its nearest and furthest point, respectively, northwest of the Project's RoW and landfall facilities.

Habitats and Flora

Based on available information, it is estimated that construction activities are likely to directly affect approximately 16.6 ha of the development site occupied by vineyard / meadow habitat and shiblyak woodland. Based on information gathered for the ESIA, data on the habitats contained within Club Village Chateau development footprint is presented within Table 20.10. For illustrative purposes, the area of habitat loss for the Project, the Russkaya CS and the Club Village Chateau development are presented.

Table 20.10 Comparative Direct Habitat Loss between the Project, Russkaya CS and the Club Village Chateau Development

Habitat Type	Project's Direct Habitat Loss (ha)	Russkaya CS Direct Habitat Loss (ha)	Club Village Chateau Development Habitat (ha)
Shiblyak	3.5	57	2.2
Juniper woodlands	2.6	5.3	0
Mesophilic forest	1.4	5.4	0

Continued…

Habitat Type	Project's Direct Habitat Loss (ha)	Russkaya CS Direct Habitat Loss (ha)	Club Village Chateau Development Habitat (ha)
Steppefied secondary meadow	4.1	21.3	0
Mesophilic meadow	0	0.4	0
Tomillyar	0	0	0
Agricultural habitats / urban areas	53.3	21.9	14.4
Total	**65.1**	**111.3**	**16.6**

Complete.

Cumulative habitat loss within the wider environment is acknowledged as a potentially adverse impact if appropriate measures are not taken to mitigate for such losses. The residual impacts of the Project are anticipated to be **Not Significant**, due to the provision of mitigation measures (including a BAP) which will aim to achieve no net loss of biodiversity and a net gain in Critical Habitat. Accordingly, the Project is not anticipated to make a significant contribution to cumulative impacts with the Club Village Chateau development or any other cumulative scheme.

Nevertheless, South Stream Transport will engage with the developers of the Club Village Chateau development (Fund Yug) with the aim of aligning their mitigation measures with those of the Project, where practicable.

Fauna

As a large proportion of the Club Village Chateau development is contiguous with the Project's Study Area, it is likely that populations of species which have been recorded during surveys for the Project, including herpetofauna, birds, mammals, and invertebrates, will use and be supported by the habitats contained within the Club Chateau Village development footprint.

In terms of potential cumulative impacts to fauna, the following impacts are considered key to the cumulative impact assessment:

- Direct loss and indirect degradation to habitats (including foraging, sheltering, breeding, and hibernation habitat for species);
- Potential mortality, injury and disturbance to species supported within these habitats; and
- Habitat fragmentation and severance.

The Project will implement various measures to safeguard species during the Construction Phase (including design controls, appointment of an Ecological Clerk of Works (ECoW), sensitive timing of works, as well as fencing and a programme of capture and placement). These measures, in conjunction with implementation of a BAP are anticipated to reduce the residual

impact of potential Project-related mortality, to **Not Significant** levels. The contribution of the Project to cumulative impacts is, therefore, considered to be **Not Significant**.

Although it is not anticipated that the Project's contribution to the cumulative impact of severance will be significant, there is nonetheless the potential for habitat severance within the wider environment to be exacerbated if the Club Village Chateau development does not implement appropriate mitigation. As discussed above, South Stream Transport will engage with the developers of the Club Village Chateau development (Fund Yug) with an aim to align their mitigation measures with those of the Project and develop measures to enhance biodiversity management within the wider area where practicable.

20.7.4.5 All Developments

The sections above consider the potential for cumulative ecological impacts to be generated taking account of the various developments scoped into the CIA. However, Table 20.11 considers potential cumulative habitat losses should the Project, the Russkaya CS, Anapolis and the Club Village Chateau developments all be constructed.

Table 20.11 Comparative Direct Habitat Loss of the Project, Russkaya CS, Anapolis and the Club Village Chateau Developments

Habitat Type	Project's Direct Habitat Loss (ha)	Total Direct Habitat Loss (ha) from the Project, Russkaya CS, Anapolis and the Club Village Chateau Developments
Shiblyak	3.5	92
Juniper woodlands	2.6	12.2
Mesophilic forest	1.4	11.3
Steppefied secondary meadow	4.1	26.8
Mesophilic meadow	0	1.6
Tomillyar	0	0.7
Agricultural habitats / urban areas	53.3	102.7
Unknown	-	9.4
Total	**65.1**	**257.9**

Table 20.11 indicates that Project, the Russkaya CS, Anapolis and the Club Village Chateau developments could result in the direct cumulative loss of approximately 257.9 ha habitat loss (of which approximately 25% is associated with the Project).

Such cumulative habitat loss within the wider environment is acknowledged as a potentially significant adverse impact if appropriate measures are not taken to mitigate for this loss. The

residual impacts for the Project are anticipated to be **Not Significant**, due to the provision of mitigation measures (including a BAP) which will aim to achieve no net loss of biodiversity and a net gain in Critical Habitat. Accordingly, the Project is not anticipated to make a significant contribution to the cumulative impacts due to habitat losses as associated with these collective developments.

As discussed above, South Stream Transport will engage with the developers of the Anapolis and the Club Village Chateau developments (Fund Yug) and with Gazprom Invest with an aim to align their mitigation measures with those of the Project and develop measures to enhance biodiversity management within the wider area, where practicable.

20.7.5 Marine Ecology

Chapter 12 Marine Ecology (as summarised in Table 20.2) reports that residual marine ecology impacts are predicted to be **Low Adverse.**

As illustrated in Section 20.6.3, none of the developments scoped into the CIA involve significant marine construction activities (see Table 20.4) (noting that the Russkaya CS development will involve the use of marine vessels for materials supply, whereas impacts upon ecological receptors (such as noise) are most likely to be associated with pipe-laying and trenching activities rather than marine vessel passage). As such, it is considered that none of these developments has the potential to generate any potentially significant cumulative marine ecological impacts.

As noted in Table 20.3, with regard to potential Rosneft oil and gas exploration activities, South Stream Transport will seek to further liaise with Rosneft with the aim of minimising the potential for cumulative marine environmental impacts that might result from any simultaneous activities.

20.7.6 Landscape and Visual Impacts

Chapter 13 Landscape and Visual (as summarized in Table 20.2) indicates that during the Construction and Pre-Commissioning Phase the Undulating Plateau landscape character area (LCA) would be subject to a temporary **Moderate** Adverse impact. However, such impact would be short term and will be **Not Significant** during the Operational Phase. With regard to visual impacts, during the Construction and Pre-Commissioning Phase the majority of residual visual impacts are identified to be either **Not Significant** or **Low Adverse**. However, a number of **Moderate Adverse** residual visual impacts have been identified in respect of the following receptors (principally due to the visual intrusion of construction activities and equipment):

- Recreational visitors to the seashore;
- Walkers on the coastal path along the cliff top;
- Visitors to the Russian Orthodox and Armenian cemetery at Varvarovka;
- Residents living at north east Varvarovka; and
- Recreational boat users.

These impacts are mostly direct, temporary and short-term. Visual impacts during the Operational Phase would be either **Not Significant** or **Low Adverse**.

The sections below consider the cumulative impacts upon landscape character and visual receptors resulting from the Project in combination with the various developments scoped into the CIA during the Construction and Pre-Commissioning Phase only (as potential Operational Phase cumulative impacts are considered to be **Not Significant**) (see Table 20.4).

20.7.6.1 Undulating Plateau Landscape Character Area

Construction and Pre-Commissioning Phase site clearance and construction works for the Project are assessed to result in a temporary **Moderate Adverse** residual impact upon the Undulating Plateau LCA. Additional landscape and visual impacts will also result from some of the developments scoped into the CIA that will be under development within the Undulating Plateau LCA at the same time as Project construction activities – e.g. construction works associated with the Russkaya CS, the Lesnaya Polyana development, the Club Village Chateau and the Anapolis development (the assessment also considers as applicable land developments such as those at Utrish, the Zapovedny development and developments in eastern Sukko) (see Table 20.4).

The area of the Russkaya CS development would equate to approximately <2% (approximately 95 ha) of the total LCA within the Survey Area (approximately 4,241 ha). Thus the Russkaya CS development plus the Project would cover a combined area that equates to approximately <2.25% of the LCA area within the Survey Area. Therefore, these collective developments will only impact upon a minimal total area of the Undulating Plateau LCA. Furthermore, the undulating nature of this LCA result in concealed areas of land which can will largely hide developments such as the Russkaya CS and the Project landfall facilities from certain viewpoints. In addition, some of the impacts of construction upon the Undulating Plateau LCA will be reversible through the restoration of affected landscapes. Areas which are required to be left open of vegetation (the cumulative pipeline RoWs) will form features resembling unsealed tracks or roads, which are already a characteristic feature within landscape, as such tracks form the majority of the access routes to agricultural / viticultural fields.

Overall, it is considered that the collective impact upon the Undulating Plateau LCA remains Moderate Adverse, with a moderate change in localised areas which would not compromise the overall integrity of the LCA. It is also considered that the LCA has the capacity to absorb these developments. As such, the impacts of these developments would not act together with the Project's impacts to create a more significant overall landscape impact, thus indicating that cumulative impacts upon landscape character would be avoided.

20.7.6.2 Visual Receptors

Table 20.12 considers the potential for cumulative impacts at the various visual receptors scoped into the cumulative landscape and visual impact assessment during the Construction and Pre-Commissioning Phase.

Table 20.12 Potential for Cumulative Impacts upon Visual Receptors during the Construction and Pre-Commissioning Phase

Visual Receptor	Sensitivity	Project Impact Magnitude	Project Residual Impact Significance	Potential for Cumulative Impacts	Impact of Project plus Other Developments	Significance of Cumulative Impact
Visitors to the Russian Orthodox and Armenian cemetery at Varvarovka	Moderate	Moderate	Moderate	There are open views from the cemetery across the wooded valley selected for the landfall section, where nearby access roads and construction activity will be visible at a distance of approximately 1 km. At a distance of over 3.7 km, the construction of the Russkaya CS will potentially form a barely perceptible element of the views from this receptor. No other potential developments in the area will be visible to cemetery visitors.	Moderate	Not Significant
Residents living at north east Varvarovka	High	Moderate	Moderate	Above the newly constructed acoustic barrier, the taller construction plant of the Russkaya CS will potentially form a perceptible element of the views from this receptor. The construction of The Club Village Chateau development is not planned to be undertaken during the Construction Phase, and therefore no other potential developments in the area will be visible from this receptor group.	Moderate	Not Significant

Continued...

Visual Receptor	Sensitivity	Project Impact Magnitude	Project Residual Impact Significance	Potential for Cumulative Impacts	Impact of Project plus Other Developments	Significance of Cumulative Impact
Walkers on the coastal path along the cliff top	High	Low	Moderate	Views from the coastal path vary considerably depending on location and direction of view. From a short stretch of the path in the immediate vicinity of the landfall section, construction works will be visible looking inland at a distance of approximately 2.3 km. The Russkaya CS RoW would be barely perceptible beyond the Project construction works, at a distance of approximately 4.8 km. Other potential developments in the area will not be visible to coastal path users, although the Anapolis development would be visible from some parts of the coastal path which would represent an extension to the Shingari Holiday Complex (noting that construction works are not anticipated to be concurrent with the Project).	Moderate	Not Significant

Continued…

Visual Receptor	Sensitivity	Project Impact Magnitude	Project Residual Impact Significance	Potential for Cumulative Impacts	Impact of Project plus Other Developments	Significance of Cumulative Impact
Recreational visitors to the seashore, including the public beaches at Sukko and Anapa, and the private beach at the Shingari and Don holiday complexes.	High	Moderate	Moderate	Recreational users of the seashore will be able to see occasional maintenance vessels on the nearshore / offshore sections. There will be no views of the Russkaya CS (at a distance of 4.7 km) or other potential developments in the area. Some parts of the Anapolis development would be visible to some visitors, although construction works are not anticipated to be concurrent with the Project.	Moderate	Not Significant
Recreational boat users	Moderate	Moderate	Moderate	Recreational boat users will be able to see occasional maintenance vessels on the nearshore / offshore sections. There will be no views of the Russkaya CS (at a distance of approximately >5 km to the nearest section of coastline) or other potential developments in the area. Some parts of the Anapolis development would be visible to some boat users, although construction works are not anticipated to be concurrent with the Project.	Moderate	Not Significant

Complete.

The section above indicates that during the Project Construction Phase, the Project's impacts upon sensitive visual receptors would not be elevated by the other developments in the area, indicating that cumulative impacts would be avoided.

20.7.7 Socio-economics and Community Health and Safety

Chapter 14 Socio-Economics (as summarised in Table 20.2) indicates that the Project is anticipated to generate some limited beneficial impacts at the local level as a result of employment generation whilst local and regional businesses are likely to receive some limited benefits from spending on local accommodation, goods, services and facilities during the Construction and Pre-Commissioning Phase. During the Operational Phase, beneficial impacts are anticipated to be at the national level only and associated with increased demand for Russian gas and increased government revenues, taxes and royalties.

Project impacts associated with reduced revenues for tourism-related businesses, including Shingari and Don holiday complexes and also those comprising the Anapa Resort Town tourism sector, due to construction activity and economic displacement due to changes in land use have been assessed as **Not Significant**. Impacts associated with reduced revenues for the Varvarovka Horse Riding Business, under a worst-case scenario due to the potential severance of a horse riding route used by the business during the Construction Phase, have been assessed as **Low Adverse**. Potential impacts on public safety and security, on the amenity of recreational users of Sukko and Shingari beaches, and on the amenity of visitors to Varvarovka Cemetery have been assessed as **Low Adverse** (Construction and Pre-Commissioning Phase). Impacts on the amenity experienced by residents in north east Varvarovka, during the Construction and Pre-Commissioning Phase due to noise and visual impacts, have been assessed as **Moderate Adverse**. During the Operational Phase of the Project, the socio-economic impacts on property owners associated with the creation of the safety exclusion zones are assessed to be **Not Significant**.

Given that the majority of residual socio-economic adverse impacts are either **Not Significant** or **Low Adverse**, the Project has limited potential to contribute to an adverse socio-economic cumulative impact (see Table 20.4). Similarly, the Project's contribution to beneficial cumulative impacts is also limited. Nevertheless, the sections below discuss potential cumulative socio-economic impacts associated with the Construction and Pre-Commissioning Phase and the Operational Phase.

20.7.7.1 Construction and Pre-Commissioning Phase

All of the development proposals as detailed in Section 20.6.2 (and Table 20.4) have the potential to generate additional employment and additional demand for goods and services in the municipal district, and potentially further afield. Specific to the Russkaya CS, the EIA (Ref. 20.3 and Ref. 20.4) states that the creation of new jobs in the construction industry and more jobs in the service sector will result in positive impacts at a regional level. It further states that local companies may benefit from supplying construction related goods, equipment and services during construction of the development, as well as from increased demand arising from the presence of a non-local workforce. While the precise scale of increased employment and additional demand for goods and services associated with the Russkaya CS is not known, it is

likely to amplify the limited beneficial economic impacts associated with the Project for local communities. It is, therefore, expected that the beneficial impact of the Project on local employment and the demand for goods and services would be elevated by the other cumulative development proposals.

Chapter 14 Socio-Economics identified the potential for **Not Significant** and **Low Adverse** economic and community-related residual impacts on several receptors in relation to construction works in the nearshore and offshore sections; this included the Shingari and Don Holiday Complexes, the Anapa Resort Town tourism sector, the Varvarovka Horse Riding Business, as well as due to amenity impacts on recreational users of Sukko and Shingari beaches and also visitors to the Varvarovka Cemetery. However, most of the developments scoped into the CIA located in the Anapa Resort Town municipal district are not located within view of the coast at the Shingari Holiday Complex and Sukko Beach, nor will they have any indirect impacts on the coastal environment. The potential Anapolis development will be located adjacent to the Shingari Holiday Complex, however, it is considered most likely that this development's construction phase will occur after the Project, thus avoiding the potential for Construction Phase cumulative impacts. Furthermore, the visual impact assessment has also concluded that cumulative impacts on assessed recreational and tourism-related receptors would not be significant. Therefore, other development proposals in the vicinity of the Project are not anticipated to give rise to any adverse economic cumulative impacts on these receptors.

With regard to the impact on the Varvarovka Horse Riding Business, the assessment was based on a potential worst-case scenario due to the lack of clear understanding of the precise alignment of the routes used by the business; with a commitment made to work with the horse riding business to undertake further investigation and, if necessary, to identify a suitable alternative route. This mitigation, if required, would also consider the location of cumulative developments to ensure that any identified alternative route was not compromised by such developments. It is expected that having regard to cumulative developments in this way would ensure that impacts on the business would not be exacerbated as a result of any cumulative development.

The socio-economic assessment has also identified the potential for **Moderate Adverse** amenity-related impact on residents in north east Varvarovka. This assessment has been concluded on the basis of the results of the noise and visual impact assessments; which have shown the potential for low and moderate adverse residual impacts. In both cases, the cumulative assessments for noise and visual (see Section 20.7.3 and Section 20.7.6) have concluded that the other developments scoped into the CIA would not be likely to add to or exacerbate such impacts upon residents in north east Varvarovka. Accordingly, it is concluded that there would be no additional cumulative amenity-related impacts on residential receptors in north east Varvarovka.

With regard to impacts on land users, the Russkaya CS, Lesnaya Polyana and Anapolis developments are being developed on former agricultural fields, removing those fields from agricultural use. Specific to the Russkaya CS, the EIA (Ref. 20.3 and 20.4) has stated that the impact on agricultural land will be negligible, in part due to the temporary nature of the impact and also due to mitigation, including compensation and re-cultivation of the affected land, which will be applied. In the case of the other two sites, the site land and surrounding land is all owned and managed by the same parent company.

It is presumed that for the Russkaya CS, all of the associated impacts have been subject to (or will be subject to) the relevant regulatory requirements governing the process of change of land use and, where applicable, take up of land, including with regard to reimbursement in full for losses associated with the short-term and long-term cessation of existing land uses (as stated within the Russkaya CS EIA). Therefore, it is not expected that the developments scoped into the CIA will give rise to any adverse cumulative economic impacts in this regard.

With regard to impacts on the community due to the conduct of the workforce during the Project Construction and Pre-Commissioning Phase, it is possible that the construction workforce for some of the other development proposals will include at least a portion of non-local workers. Specific to the Russkaya CS, the EIA (Ref. 20.3 and 20.4) has stated that there is the potential for construction to require non-local workers from other areas of Krasnodar Krai. It is further known that a construction labour camp has been constructed to the north of Gai Kodzor for non-local workers for whom the construction site is too far from their usual place of residence to allow them to travel on a daily basis. The impact assessment for the Russkaya CS does not define the number of construction workers or assess the potential impact of the presence of the non-local workers on the health, safety and security of the local population, and it is not known if there is a management regime in place to govern the behaviour of the workers if and when they are out in neighbouring towns and villages. Therefore, it is possible that the presence of non-local workers could potentially lead to adverse impacts on public safety and security.

Given the mitigation measures as recommended in **Chapter 15 Community Health, Safety and Security**, the Project's impacts resulting from the conduct of the construction workforce in the community and the spread of sexually transmitted infections (STIs) due to the influx of workers to the area are both assessed as being **Low Adverse** (see **Chapter 15 Community Health, Safety and Security**). Additional workers associated with other developments could potentially exacerbate these impacts. South Stream Transport will liaise with Gazprom Invest with the aim of developing aligned and coordinated mitigation approaches to minimise the potential for cumulative public health and security impacts as associated with the influx of construction workers and construction activities.

20.7.7.2 Commissioning and Operational Phase

Chapter 14 Socio-economics identified beneficial impacts arising from the increase in government revenues and increased demand for goods and services associated with the gas extraction industry in Russia. Specific to the Russkaya CS, the EIA (Ref. 20.3 and 20.4) identified long term economic beneficial effects for Russia due to increased potential for gas exports, and the potential for associated increases in foreign current revenues and tax revenues for the (Russian Federal) state budget. However, as the assessment of beneficial impacts presented in Chapter 14 assumed completion and operation of the entire South Stream Pipeline System, the cumulative impacts of the Russkaya CS have already been accounted for.

With regard to impacts on land use associated with the operational safety exclusion zones, the Russkaya CS will not itself directly impact on the same land as impacted by the Project. Additionally, the compressor station and the pipelines leading from it westwards to the Project landfall facilities are entirely surrounded by forest, and so the creation of any similar safety

exclusion zones (if designated) would not restrict any commercial or residential land uses. The remaining other developments scoped into the CIA will not have any impacts in this regard.

20.7.8 Ecosystem Services

As detailed in Section 20.3 the CIA methodology considers VECs which are environmental and social attributes that should *"reflect public concern for social, cultural, economic or aesthetic values, and also the scientific concerns of the professional community"* (Ref. 20.2). There are therefore strong parallels between VECs and ecosystem services, where the type and level of service provision (and the value this confers) is determined by:

- The condition of the underlying habitat or ecosystem type;
- The functioning of ecosystem processes and the interactions between them; and
- The importance of the services to beneficiaries (in terms of livelihoods, health, safety, and cultural heritage) and the Project (in terms of social, operational, financial, regulatory, and reputational risks).

IFC PS1 limits the cumulative impacts to be addressed to *"those impacts generally recognised as important on the basis of scientific concerns and / or concerns from Affected Communities"* (Ref. 20.1). The CIA is therefore concerned with assessing the incremental impact of the Project on *priority* ecosystem services and their beneficiaries in relation to the combined impacts of multiple developments. For the purposes of this assessment, VECs are therefore defined as the priority ecosystem services as identified in **Chapter 17 Ecosystem Services**.

Chapter 17 describes residual impacts upon the following ecosystem services: crops, capture fisheries, water (supply), hazard regulation, air quality regulation, water quality regulation, soil quality regulation, tourism and recreation values, cultural and spiritual values and wild species diversity). As summarised in Table 20.2, all residual impacts are predicted to be either **Not Significant** or **Low Adverse** during all Project phases. This indicates that the Project's ability to contribute to a cumulative impact upon ecosystem services in the vicinity of the Project with other potential developments scoped into the CIA is limited.

However, as detailed in Section 20.4, where there are Low Adverse residual impacts, further evaluation has been undertaken to see if there is scope for cumulative impacts to be generated, for the following ecosystem services:

- **Crops:** Project clearance of agricultural land, restrictions on re-use, dust released during construction activities and leaks or spills could result in a **Low Adverse** impact on crop production, and the associated loss of jobs. As indicated in **Chapter 17 Ecosystem Services**, the Project will result in around 8.7 ha of agricultural land being taken out of agricultural use permanently, 23.75 ha will require temporary clearance before being returned to the land owner following the Construction Phase, whilst 21.05 ha will be returned to the landowners, but future use will be restricted;
- The Russkaya CS, Lesnaya Polyana, Anapolis and Club Village developments will all impact upon some agricultural areas, thus removing further land from agricultural use. The Russkaya CS development could impact upon approximately 21.9 ha of agricultural land – although the Russkaya CS EIA (Ref. 20.3 and 20.4) states that the residual impact on

agriculture would be negligible given that: damage will be compensated in accordance with Russian law; some impacts will be temporary; and upon completion of construction, some land will be re-cultivated and returned to the land users in a condition suitable for agriculture. The Lesnaya Polyana development is understood to have already resulted in land being cleared, whilst the Anapolis development is estimated to result in the loss of approximately 13.1 ha of agricultural land (see Table 20.9) and Club Village Chateau development will potentially remove approximately 14.4 ha of vineyards (see Table 20.10). These developments will all result in additional losses of agricultural land. However, with the implementation of defined Russkaya CS mitigation proposals, and given that the Lesnaya Polyana, Anapolis and Club Village Chateau sites are all owned by the same developer who is potentially able to absorb any displaced workforce at other owed sites, significant cumulative impacts upon this ecosystem service are not anticipated;

- **Hazard Regulation:** Activities such as ground works, vegetation clearance, and changes to topography undertaken for the proposed developments scoped into the CIA could have a collective impact on soils and water flows in the area which could potentially increase the risk of hazards such as flooding and landslides to beneficiaries living and working within the Local Area. However, as set out in Section 20.7.1, there are unlikely to be any significant cumulative soil or water resource impacts as generated by the Project and the Lesnaya Polyana, Club Village Chateau or Anapolis developments. With regard to the Russkaya CS, the mitigation measures set out for the Project (including restoration of natural vegetation) and those defined for the Russkaya CS development mean that any cumulative impacts on surface water flows and soil stability are likely to be of **Low Significance** due to the ephemeral nature of the watercourses in the catchment and the temporary duration of development construction activities;
- **Water Quality Regulation:** As identified in **Chapter 17 Ecosystem Services**, the main impacts on the regulation of water quality are likely to arise in the marine environment due to disturbance of sediment during dredging processes and potential leaks and spills. Since none of the proposed developments have a marine component, significant cumulative impacts on marine water quality regulation will be avoided. Within the terrestrial environment, vegetation clearance together with increased risk of spillages from other developments scoped into the CIA could potentially have a greater cumulative impact on the regulation of surface water quality (e.g. potential cumulative impacts on the Shingari River arising from the Project (microtunnelling site) and developments such as Lesnaya Polyana, Club Village Chateau and Anapolis). However, as set out Section 20.7.1, the low likelihood of spillages, differences in the development construction schedules, together with the localised and temporary nature of any water quality impacts suggests that cumulative impacts are unlikely to be significant. As such there are not likely to be any significant cumulative impacts on the regulation of marine and fresh water quality or those who benefit from this service;
- **Tourism and Recreation Values:** The developments scoped into the CIA and Project together are unlikely to have any cumulative impact on the provision of, or access to, tourism and recreation services (e.g. through loss of access to recreational areas). However, there are potential impacts upon the quality of tourism and recreation services due to cumulative impacts on the prevailing landscape character and visually sensitive human receptors during construction and operation. As discussed in Section 20.7.6 and Section

20.7.7, any such visual impacts are not likely to be significant due to the distance of developments from the receptors, the ability of the natural environment to absorb visual impacts of development, and the difference in timing schedules of the developments.

Given this, it is considered that the cumulative impacts of the Project and the developments scoped into the CIA are unlikely to have a significant lasting impact on the ability of any residents or visitors to benefit from the recreational and tourism opportunities provided by the affected ecosystems; and

- **Cultural and Spiritual Values:** The developments scoped into the CIA have the potential to affect the provision of cultural and spiritual values through impacts upon the prevailing landscape character within which sites and features of cultural and spiritual significance reside. However, as set out in Section 20.7.6, the cumulative impact of the collective developments will only impact a small area of the landscape. Furthermore, the undulating nature of the landscape is effective at absorbing such developments and habitat restoration activities will further reduce any impacts. Potential human receptors identified in **Chapter 17 Ecosystem Services** who benefit from this service include visitors to the Varvarovka cemetery who are likely to be subject to visual and noise disturbance. However, at a distance of over 3.7 km, the construction of the Russkaya CS will form a barely perceptible element of the views from this receptor and there are no other potential developments in the area that will be visible to cemetery visitors. However, the combined traffic from the Project and Russkaya CS may result in greater cumulative impact on visitors to the cemetery and in order to minimise such impacts South Stream Transport will liaise with Gazprom Invest with the aim of developing aligned and coordinated traffic management plans.

20.7.9 Cultural Heritage

Chapter 16 Cultural Heritage (as summarised in Table 20.2) reports residual cultural heritage impacts as follows:

- Residual impacts predicted to be **Not Significant** or **Low Adverse** for all terrestrial cultural heritage features, with impacts mainly being related to ground disturbance and increases in construction traffic; and
- Residual impacts predicted to be **Not Significant** or **Low Adverse** for marine cultural heritage features, except Moderate Adverse impacts upon RU-MCH-003 amphora and RU-MCH-004 wooden shipwreck.

All terrestrial cultural heritage residual impacts are predicted to be either **Not Significant** or **Low Adverse** during all Project phases. Given that none of the developments scoped into the CIA (see Table 20.4) will have a direct impact upon any of these defined terrestrial cultural heritage features indicates that cumulative impacts will be avoided.

However, the construction vehicles servicing the Russkaya CS development will use some of the same access routes used by the Project, including a permanent access route that will be constructed by Gazprom Invest. This permanent access road will be located in proximity of a known cultural heritage receptor (the Varvarovka Russian and Armenian cemetery (RU-TCH-06)), but its route has been selected to avoid running directly alongside the cemetery

(**Chapter 16 Cultural Heritage**). Due to the road alignment, visitors to the cemetery will experience an impact of negligible magnitude (resulting in residual impact of Not Significant) due to the Project. Nevertheless, the combined traffic from the Project and Russkaya CS may result in greater cumulative impact on visitors to the cemetery and in order to minimise such impacts South Stream Transport will liaise with Gazprom Invest with the aim of developing aligned and coordinated traffic management plans.

With regard to marine cultural heritage, none of the developments scoped into the CIA involve significant marine construction activities or seabed intervention works (noting that the Russkaya CS development will involve the use of marine vessels for materials supply which are not anticipated to impact upon marine cultural heritage) (see Table 20.4). As such, it is considered that no potentially significant cumulative cultural heritage impacts will occur (both Construction and Pre-Commissioning Phase and Operational Phase).

As noted in Table 20.3, with regard to potential Rosneft oil and gas exploration activities, South Stream Transport intends to liaise with Rosneft with the aim of minimising the potential for cumulative marine environmental impacts that might result from any simultaneous activities.

20.7.10 Waste Management

Chapter 18 Waste Management included an assessment of waste management impacts arising from the Project waste streams that will be produced during the Construction and Pre-Commissioning Phase and during the Operational Phase. The chapter indicated that residual waste impacts would generally be **Not Significant** to **Low Adverse** following the preparation and implementation of a comprehensive integrated Waste Management Plan (described in **Chapter 22 Environmental and Social Management**). However, **Chapter 18 Waste Management** indicates that the main regional landfill site (Alfa landfill) is not designed or operated as an engineered landfill in accordance with GIIP, and hence has been identified as being a sub-optimal waste disposal facility. As a result, any Project waste disposed of at the Alfa landfill would result in a Moderate Adverse impact (due to waste disposal in an unlined landfill). Alfa landfill is due to be replaced once it ceases operation in 2016, and thereafter the replacement landfill would be used by the Project. This is expected to be an engineered facility (although its location is yet to be confirmed by the local government).

In the event that any Project wastes are deposited at Alfa landfill, the impacts are not expected to be environmentally significant. This is the case since the Project wastes that require landfill disposal are non-hazardous, whilst the waste quantities arising from the Project are relatively small (typically less than 1,000 tonnes per waste stream – refer to **Chapter 18 Waste Management**) and would form only a very small proportion of the overall waste disposed of at Alfa, such that they would not significantly increase any existing environmental impacts associated with the landfill site.

Of the developments scoped into the CIA (see Table 20.4), only the Russkaya CS is considered to be able to generate waste volumes that may add pressure on local waste storage and disposal facilities in the area. The Russkaya CS EIA (Ref. 20.3 and 20.4) indicates that during the construction phase some 502,484 tons of waste will be generated, and of this 27,734 tons will be subject to re-use or recycling at third-party enterprises, whilst 474,750 tons will be transferred to a specialized waste disposal enterprise. Assuming that the Alfa landfill is being

used by Russkaya CS developers, waste disposal practices may be adding to existing capacity issues at the landfill.

Given that the quantities of hazardous and non-hazardous waste arisings from the Project are so small when compared to total regional arisings, it is considered that the Project is not able to contribute to a significant cumulative waste management impact. Although large quantities of uncontaminated soil and rock will be generated by the Project, this is not expected to give rise to significant cumulative impacts since such materials will be used for backfill or restoration purposes at quarry or landfill sites in the region; and since the material is inert, it is unlikely to give rise to significant environmental impacts. South Stream Transport will seek to engage with Gazprom Invest to investigate the potential beneficial use of inert materials (soils or rock) generated by the Project and the Russkaya CS development.

20.7.11 Land-based Traffic and Transportation

The sections above present an evaluation of the potential cumulative impacts upon identified VECs that may occur as a result of Project interactions with various development proposals. This analysis has not identified any potentially significant cumulative environmental or social impacts with regard to land-based traffic and transportation during any Project phases (e.g. air quality, noise and vibration, cultural heritage etc.).

However, Appendix 9.1: Traffic and Transport Study indicates that the Project has the potential to increase traffic flows on some transportation links during the Construction and Pre-Commissioning Phase. Once the Pipeline is operational, traffic will be limited to servicing and maintenance vehicles - such low levels of traffic will not have a traffic impact.

Appendix 9.1 indicates that during the Construction Phase, the Project will generate traffic arising from the transportation of materials from a Russian Black Sea port. Pipes and equipment that are required for the landfall section will be delivered by existing roads to a point north of Gai Kodzor. A temporary bypass has been constructed for heavy construction vehicles to avoid this community and this will be used both by the vehicles related to the construction of the Russkaya CS development and Project vehicles. Workers may also have to be transferred to and from Anapa on a daily basis if they are accommodated in Anapa. There will also be a need to export excavated material that is not suitable as fill material, and to import suitable fill material to make up the shortfall in suitable material. The construction traffic has been estimated for a range of activities which indicates that over the predicted 25 month duration of the contract, there will be a total of over 110,000 traffic movements which averages at approximately 4,500 movements per month or 189 per day.

In terms of vehicle kilometres travelled by construction related traffic, a significant portion of trips will occur on the M25 either west or east of Rassvet. The geometry of the M25 and the current traffic flows are such that it is a satisfactory route to be used by construction traffic. Traffic flow impacts associated with construction traffic travelling between the junction on the M25 at Rassvet and the landfall site will be partially negated by the provision of the bypass to Gai Kodzor and the proposed link from the south of that settlement to the landfall site, which means that to the south of Rassvet the heavy construction traffic will avoid locations where there may be sensitive receptors.

The section of the road between Rassvet and the northern end of the temporary construction bypass of Gai Kodzor could experience increases in traffic flow of up to 30% with an increase in the number of heavy construction vehicles approaching 200%.

It is noted that the road through Rassvet already carries appreciable levels of heavy goods vehicles associated with the construction works of the Russkaya CS development. Therefore, the traffic associated with the Project will be an extension of an existing impact, rather than the introduction of a new impact. The traffic assessment concludes that with the provision of the construction traffic bypasses, the highway network is capable of accommodating the additional traffic without there being any perceptible impact on other road users with the exception of the section of route through Rassvet.

Given the details presented above, it is considered that Project construction will result in increases in traffic on some transportation links that are currently being used by Russkaya CS construction traffic. The Project will thus contribute to a potential cumulative increase in traffic flows through Rassvet. The Project includes a range of mitigation measures that aim to minimise the environmental and social consequences of traffic flow increases through Rassvet (refer to **Chapter 15 Community Health, Safety and Security**). However, there is also a commitment to further assessment of potential impacts and investigation of additional mitigation measures, if needed. South Stream Transport will liaise with Gazprom Invest with the aim of developing aligned and coordinated construction traffic management plans.

20.8 Cumulative Impact Mitigation, Monitoring and Management

The CIA has not identified any cumulative environmental or social impacts that are considered to be significant and in need of specific mitigation measures, monitoring or management beyond those already being undertaken for the Project (see **Chapter 22 Environmental and Social Management**). However, the assessment has made a number of recommendations with regard to the alignment of mitigation strategies with local developers – this includes the following:

- South Stream Transport will seek to engage with Gazprom Invest with the aim of aligning Gazprom Invest's ecological mitigation strategy and mitigation measures as related to the Russkaya CS development with those of the Project. Of particular importance should be the avoidance of impacts through the sensitive timings of works (including the herpetiles hibernation period), implementation of herpetile fencing and a programme of translocation, and adherence to good industry practice as well as to develop measures that would enhance biodiversity management within the wider area;
- South Stream Transport will seek to engage with Gazprom Invest to investigate the potential beneficial use of inert materials (soils or rock) generated by the Project and the Russkaya CS development;
- South Stream Transport will liaise with Gazprom Invest with the aim of developing aligned and coordinated traffic management plans;
- South Stream Transport will engage with the Anapolis and the Club Village Chateau developers with the aim of aligning the developers' mitigation measures with those of the

Project. Furthermore, in developing their BAP, South Stream Transport will engage with these developers with an aim to develop measures that would enhance biodiversity management within the wider area;

- South Stream Transport will liaise with Gazprom Invest with the aim of developing aligned and coordinated mitigation approaches to minimise the potential for cumulative public health and security impacts as associated with the influx of construction workers and construction activities; and
- South Stream Transport will seek to further liaise with Rosneft with the aim of minimising the potential for any cumulative marine environmental impacts that might result from any simultaneous activities.

20.9 Assumptions and Limitations

This CIA has been undertaken based upon the available information contained within this ESIA Report. Key assumptions and limitations are detailed below:

- The CIA is restricted to Russian VECs and only concerns potential cumulative impacts associated with the Project (i.e. within Russia);
- The assessment only considers residual impacts after the implementation of mitigation measures as detailed in this ESIA Report;
- The assessment has not considered unplanned events as discussed in **Chapter 19 Unplanned Events**;
- Details regarding some land development projects within the vicinity of the Project are limited, whilst several have not been subject to any formal environmental impact assessment process. This has limited the CIA to only consider potential cumulative impacts on a qualitative basis in some cases; and
- The CIA excludes potential cumulative impacts during the Decommissioning Phase given that the decommissioning programme is uncertain and will only be developed during the Operational Phase of the Project, whilst other developments that may be taking place at the same time as decommissioning activities are also unknown.

20.10 Conclusions

Whilst there are a number of developments in the near vicinity of the Project, such as the Russkaya CS development and various residential developments, this CIA has not identified any adverse environmental or social cumulative impacts that are considered to be significant and in need of specific mitigation measures, monitoring or management by the Project, although various recommendations are made with regard to the alignment of local developers' mitigation strategies with those of Project.

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