

ZAO "ACHIMGAZ"

**Development of the Achimov Block 1A gas
and gas condensate formation within the
Urengoy field**

Yamal-Nenets Autonomous Okrug (YNAO), Russia

Executive Summary Report

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Approved by:



Sergey Bourtsev

Managing Partner,
Director of the Moscow and Almaty offices,
ERM Eurasia Limited

ERM Eurasia Ltd confirms that this Report has been prepared with all reasonable skill, care and diligence and in conformity with the professional standards as may be expected from a competent and qualified consultant acting as Environmental Consultant having experience in providing services for projects with similar scope of work, complexity, issues and scales.

This Report has been prepared in accordance with the terms of the contract concluded with the Client and the generally accepted environmental consulting practices and for intended purposes stated in the Contract. The conclusions and recommendations made in this Report are based upon information obtained directly by *ERM Eurasia Ltd*, as well as information provided by third parties, which we believe to be accurate.

This Report has been prepared for the ZAO *Achimgaz* and we accept no responsibility for third parties whatsoever who may use all or portions of the information contained in this Report.

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LIST OF ACRONYMS

Acronym	Full Form
bcma	Billion cubic meters per annum
BCS	Booster Compressor Station
CO	Carbon monoxide
CO ₂	Carbon dioxide
GDU	Gazprom Dobycha Urengoy
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FFD	Full Field Development
GHG	Greenhouse gas
H&S	Health and Safety
HAZID	Hazards identification study
HAZOP	Hazard and operability study (analysis)
HSE	Health, Safety and Environment
IFC	International Finance Corporation
IMN	Indigenous Minorities of the North
IRP	Incident Response Plan
ISD	Industrial Safety Declaration
NO ₂	Nitrogen dioxide
PP	Pilot Phase
RF	Russian Federation
RUB	Russian rouble
SO ₂	Sulphur dioxide
SPNA	Specially Protected Natural Area
SRP	Spill Response Plan
SUC	Start-up Complex
SVI	Sensitivity/Vulnerability/Importance
TVC	Topsoil and Vegetation Cover
TVD	True Vertical Depth
UKPG	Gas treatment plant
YNAO	Yamal-Nenets Autonomous Okrug (District)
ZAO	Closed Joint-Stock Company (CJSC)

This Executive Summary Report reflects the findings of the Environmental and Social Impact Assessment (ESIA) performed for the Full Field Development stage (FFD) by ZAO Achimgaz of the Achimov Block 1A gas and gas condensate formation (the Project), which is located within the Urengoy Field in Western Siberia, Russia.

The ESIA revealed that methods of construction and operation of the Project by ZAO Achimgaz broadly comply with the international standards (as was also demonstrated by the IFC Compliance Audit performed by ERM in 2013). To avoid potential impacts ZAO Achimgaz has already integrated a number of technical and operational controls in the original design.

A number of potential impacts of field operations (noise, air pollution, vibrations) do not affect the local population as the distance to the nearest settlement - the city of Novy Urengoy is more than 30 km.

The Environmental and Social Impact Assessment did not reveal any major impacts and only several *moderate* impacts.

Most of potential *moderate* impacts are associated with the activities that are intrinsic to the Project and cannot be avoided/mitigated any further.

The rest of potential environmental impacts are of *minor* and *negligible* significance.

No significant impacts on local indigenous population were identified, as they had left the Project Area and its surroundings prior to commencement of the Project, due to the earlier industrial activities of other operators. Irrespective of this the indigenous groups receive compensation/subsidies from ZAO Achimgaz as well as other operators.

With respect to potential incidents/emergencies, ZAO Achimgaz has designed all facilities in accordance with the obligatory RF safety standards, including the development of detailed Industrial Safety Declarations (ISD). Furthermore, ZAO Achimgaz undertakes routine HAZID and HAZOP studies as per good international practice as a way of optimizing design and operational safety.

1.1

PROJECT BACKGROUND AND REGIONAL CONTEXT

The Urengoy field, one of the world's largest onshore gas fields and extending about 6,000 km², was discovered in 1966 and the first production of gas began in 1978. Meanwhile, there are several dozen operators within the Urengoy Field and over 2,800 wells currently in operation feeding 22 central gas treatment/production plants ("UKPG") to produce about 96 billion cubic meters per year (2013) of gas and condensate.

ZAO Achimgaz (a joint-venture of Wintershall and Gazprom) is one of the operators in Urengoy with a license to explore the deeper Achimov formation. The activities of ZAO Achimgaz began in 2008 with the placement of six wells during the Pilot Phase (PP). After successful testing, the Start-up Complex (SUC) was executed, followed by the Full Field Development (FFD) stage, which began in 2012, covering the License Area.

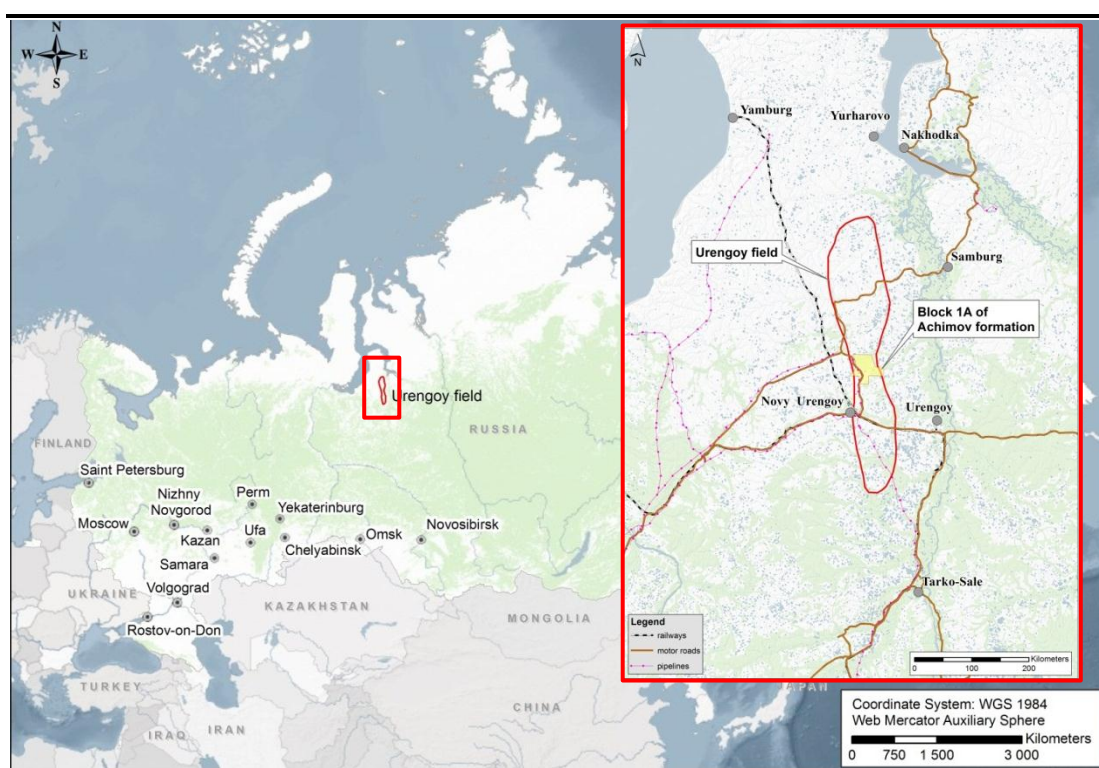
1.2 PROJECT OVERVIEW

The operations of ZAO Achimgaz take place within a leased area of about 20 km² in the south-eastern section of the Urengoy field, which is located in the northern part of Western Siberia just south of the Arctic Circle (see map below).

At the cut-off date for the ESIA assessment (31.05.2014), 26 wells are operational on six well pads, feeding UKPG-31, and three further well pads are under construction. At completion in 2020, there will be a total of 113 wells on 28 well pads (each about 6 to 10 ha in area) feeding UKPG-31 to produce about 8 bcma. While significant on its own, the ZAO Achimgaz production will represent only a fraction of the total gas production from the Urengoy field.

The maximum employment during FFD operations of Achimov Block 1A will be over 440 workers, it will provide a sizeable contribution to the regional economy.

Figure 1.2-1 Overview map



1.3 ESIA SCOPE AND APPROACH

The scope of the ESIA included the following activities:

- Current Project activities (i.e. operation of existing production and support facilities, and ongoing construction of new well cluster pads and related infrastructure);
- Planned future construction activities to complete the FFD development in 2020;
- Future operation at full production capacity until about 2049; and
- Dismantling/decommissioning and restoration of the field after 2049; these activities have not yet been planned in detail. They are assessed in a broader approach, than the fully planned activities described above.

The ESIA has been conducted in full alignment with the international impact assessment methodology, with due consideration of IFC Performance Standards (2012) and related Guidelines, as well as the Equator Principles.

The approach to this ESIA, as per common international practice, was overall to:

- (i) describe the key technical aspects of the Project (i.e. during ongoing/planned construction and operations),
- (ii) characterize the socio-ecological baseline conditions of the Project Area (including consideration of existing/previous developments on the Project Area by other operators),
- (iii) identify and assess the likely impacts that the Project may have on the baseline, including the potential cumulative effects of surrounding activities,
- (iv) derive specific and targeted mitigation measures (in case of significant impacts).

2 *PROJECT DESCRIPTION*

2.1 *PROJECT OPERATIONS*

Main onsite activities include drilling, production of natural gas, and gas preparation at the gas treatment plant (UKPG-31) for further transportation via pipeline.

The current FFD stage involves a range of construction activities, including construction of production wells and water disposal wells, well clusters and roads, infield flow-lines and facilities on the well clusters, and facilities associated to the UKPG-31.

2.2 *PROJECT IMPLEMENTATION STAGES*

The Achimov Block 1A is being developed by ZAO Achimgaz in several stages:

- Pilot Phase (PP);
- Start-up Complex (SUC);
- Full Field Development (FFD).

Each of the above listed stages has its specific technological characteristics and timeframes.

The Company will reach plateau production by 2018 (8.94 billion m³ of gas and 2.91 million tons of gas condensate per year). After 2024 production will start to gradually decline.

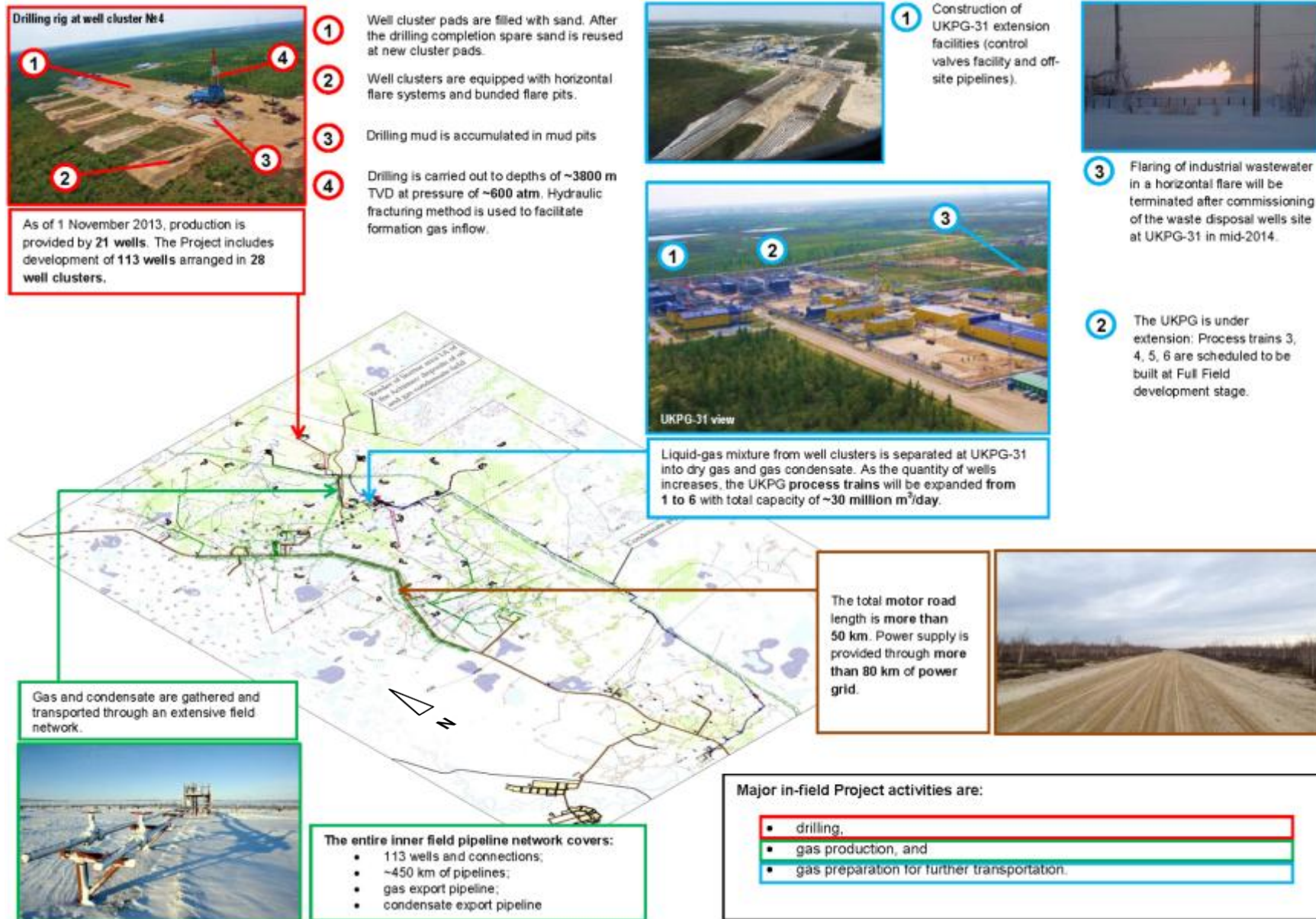
2.3 *PROJECT INFRASTRUCTURE*

ZAO Achimgaz has been producing gas and condensate from Achimov Block 1A since 2008, when the UKPG-31 became operational. Facilities essential for assessing the environmental impacts are:

- Main facilities (well clusters, gas separation plant UKPG-31).
- Auxiliary facilities (sand and peat quarries, underground water abstraction wells, power transmission lines, etc.).
- Pipelines (in-field pipelines, methanol pipelines, gas and gas condensate export pipelines, fuel gas pipeline, water supply pipeline).
- FFD facilities currently under construction.

When the Block 1A attains full development, gas will be produced from 113 wells arranged in 28 well clusters. An overview of the FFD stage is provided in *Figure 2.3-1*.

Figure 2.3-1 Achimov Block 1A Project overview



The need for the Project has been reviewed in the context of economic, environmental, socioeconomic and market factors in order to evaluate whether there are sufficient drivers to justify development of the Project.

The gas production sites location options are dictated by the geographical location of the hydrocarbon reserves. Therefore, there were only limited alternatives for determining the locations of the Project infrastructure. Nonetheless, the Project proponents considered a variety of associated factors prior to electing to develop the hydrocarbon reserves of Block 1A of Achimov formation, with the final layout arrangement considered as the optimal for the Project.

The planning concept of general layout of the Project facilities is based on the following principles:

- Division of the area into zones taking into account process links, environmental, sanitary, and fire-fighting requirements;
- Facilities layout with respect to prevailing wind directions;
- Placement of the sites outside of water protection zones of water bodies;
- Reclamation of lands allotted for temporary use and disturbed during construction.

There is a strong economic, market, and social case for the use of the Urengoy gas field resources, particularly those within Block 1A of the Achimov formation. The 'No Project' alternative does not satisfy the sustainable economic development objectives of the YNAO region. Therefore this option was not considered to represent the most efficient use of natural gas reserves. Furthermore, the 'No Project' alternative would lead to the loss of operating license by ZAO Achimgaz and consequently will diminish socioeconomic development of the region.

The Project implementation process is supported by ongoing improvements based on the review of current performance and accumulated experience from the previous Project stages, resulting in adoption of new process solutions.

4.1 PROJECT LOCATION

The Project Area is located in the northern part of Western Siberia, near the Arctic Ocean (150-200 km from the Gulf of Ob). The Block 1A of the Achimov formation is located 30 km north of the city of Novy Urengoy.

Administratively it belongs to the Purovsky district of Yamal-Nenets Autonomous Okrug (YNAO), which is part of the Tyumen oblast. Exploration and development of oil and gas fields in the region has been in progress since 1958.

4.2 ENVIRONMENTAL BASELINE

Climate, air quality and physical factors

The Project Area of Influence is characterized by an extremely continental climate and boggy, tundra landscape that was previously sparsely inhabited by semi-nomadic indigenous peoples of the North. The entire region has been heavily influenced by the development of Urengoy and other fields during the past 40 years, with construction of the many field facilities and associated roads, pipelines and other infrastructure.

Exogenous geological processes, hydrogeology

Achimov formation deposits are located in the lower section of the Cretaceous system at a true vertical depth of 3,600-3,800 m. The total thickness of the Achimov deposit varies between 80 to 420 m. The reservoir rocks are represented by the fractured-porous and porous-fractures reservoirs.

Surface water

The Project Area of Influence is located on the left bank of the Pur River, in its middle reaches. This Area is covered with numerous lakes and is crossed by many small rivers and creeks. Frost mound bogs are also common resulting from the widespread permafrost in the area.

Surface water is characterised by high concentrations of iron, manganese, copper, phenols and oil products. High content of metals and phenols are specific to the natural background concentrations.

Topsoil and vegetation cover

Tundra and podzolic soils prevail in the Project Area. About 48% of the Project plots are located in areas of tundra soils with another 41% occupying forested areas with automorphic soils.

Due to historical construction activity, areas with disturbed soil cover are widespread and are associated with operational and non-operational gas wells and cluster pads, pipelines and roads, gas treatment facilities, and quarries.

The soils are of low agricultural value with a thin fertile soil layer (topsoil) across the entire area (<10 cm).

There are some contaminated areas present within the Project Area. These contaminated areas are inherited from previous intensive gas production

activities within the Project Area which are not associated with the Project or with the Company.

The diversity of flora within the Project Area of Influence is represented by 185 species belonging to 98 genera and 46 families. It was not significantly impacted by previous activities.

No rare plant species, listed in the Red Books of the YNAO and Tyumen Oblast, were identified in the Project Area of Influence. However, according to the Project design documentation, some plants, listed in the YNAO Red Data Book may occur within the Project Area.

Fauna and wildlife populations

The fauna of the Project Area of Influence is represented by amphibians, reptiles, birds and mammals.

The avifauna consists of 109 bird species. Most species are Migrant Breeders. The mammal population of the Project Area of Influence consists of typical animals of the taiga fauna and several arctic species. Terrestrial mammals are represented by 38 species of rodents, insectivores, double-toothed rodents, carnivores, and cloven-hoofed animals. In total there are 9 rare and protected animal species potentially occurring in the Project Area of Influence.

The fish fauna consists of 17 species located mainly in the lower reaches of the Pur River.

No commercial hunting or fishing activities exist within the entire field area as access to the field is limited.

Specially Protected Natural Areas

No specially protected natural areas (SPNA) are located within the Project Area of Influence. The nearest SPNAs are Nadymsky and Nizhne-obsky nature reserves situated 84 and 228 km respectively.

Ecosystem Services

Main provisioning services within the Project Area of Influence include livestock, capture fisheries, wild foods, freshwater and genetic resources. Global climate regulation and water purification are among the most important regulating ecosystem services.

The Area has a history of more than 40-years' of gas production activities. Today multiple gas production facilities owned by a number of companies carry out gas producing activities. These companies depend on ecosystem services of the Area as sand and gravel.

4.3

SOCIAL BASELINE

The Project Area of Influence in social terms includes administrative centres of the municipalities located close to the Licence area (Novy Urengoy city and Tarko-Sale town) and the villages closest to the Project (Samburg and Urengoy).

4.3.1 *Population and demography*

At the beginning of 2013 116,500 people lived in Novy Urengoy. The population of Purovsky district (hereafter – the District) totalled 52,300 people. The District is extremely sparsely populated, with an average population density of 0.5 people per sq. km (against the YNAO average of 0.7 people per sq. km).

The city of Novy Urengoy and Purovsky district are characterised by a stable population growth. The high rate of population growth is associated with the increased proportion of the young people in the population (due to a massive inflow of people of active working age during 1970-2000 years) and the traditional demographic behaviour of indigenous people. The sex and age structure of the City and District population is characterised by the prevalence of men (as opposed to the national and Tyumen Oblast situation).

Both, the urban and rural communities are nationally diverse. Russians account for no more than 70% of the population- Ukrainians and Tatars comprise a considerable part of the community both in the City and in the District. The third largest group consist of indigenous peoples, namely Nenets.

4.3.2 *Economy*

The oil and gas industry with associated sectors forms the backbone of the District's economy. High revenues of this sector provide for surplus budget with significant part of own income, high level of activity of small and medium-sized businesses, services development in the City and region. Along with the oil and gas sector, associated construction and transport industries are also expanding.

The agricultural sector in Purovsky District is represented only by traditional land use, such as fishing and fish processing, reindeer raising, fur farming, and wild herbs gathering. The agro-industry in the District consists of eight enterprises employing 890 workers of which 80% are indigenous people representatives. Most agricultural enterprises are located on tribal lands of indigenous people and have a clan-based organisation.

The investment per capita indicator in Purovsky district is one of the highest in the country, e.g. it amounted to 2.2 million RUB per capita in 2012 (compared to 340,000 RUB per capita in the City). This is due to the large amount of oil and gas projects being implemented within the territory of Purovsky District.

4.3.3 *Employment and living standards*

Almost all working population of the City and District (90% on average in both municipalities) is involved in local businesses. The most part of employees of both the City and the District are engaged at oil and gas enterprises or at enterprises related with oil and gas sector. Oil and gas sector provides for 20% of Novy Urengoy and 47% of the District employments.

A very low level of registered unemployment is typical for both the City and the District. The unemployment rate in the City was about 0.4%, and in the District it was around 1%.

4.3.4 *Community health and safety*

General disease rate in Purovsky district was equal to 1,454 cases per 1,000 persons. In Novy Urengoy general disease rate was lower and was equal to 1,128 cases per 1,000 persons. General disease rate in the District is comparable to that of the YNAO average. Novy Urengoy health indicators are better than those of the District and the region.

4.3.5 *Cultural and archaeological heritage*

Based on the results of archaeological surveys no sites of historical or cultural value were identified both within the Project Area and its immediate proximity (Urengoy field).

5.1 IMPACT ASSESSMENT METHODOLOGY

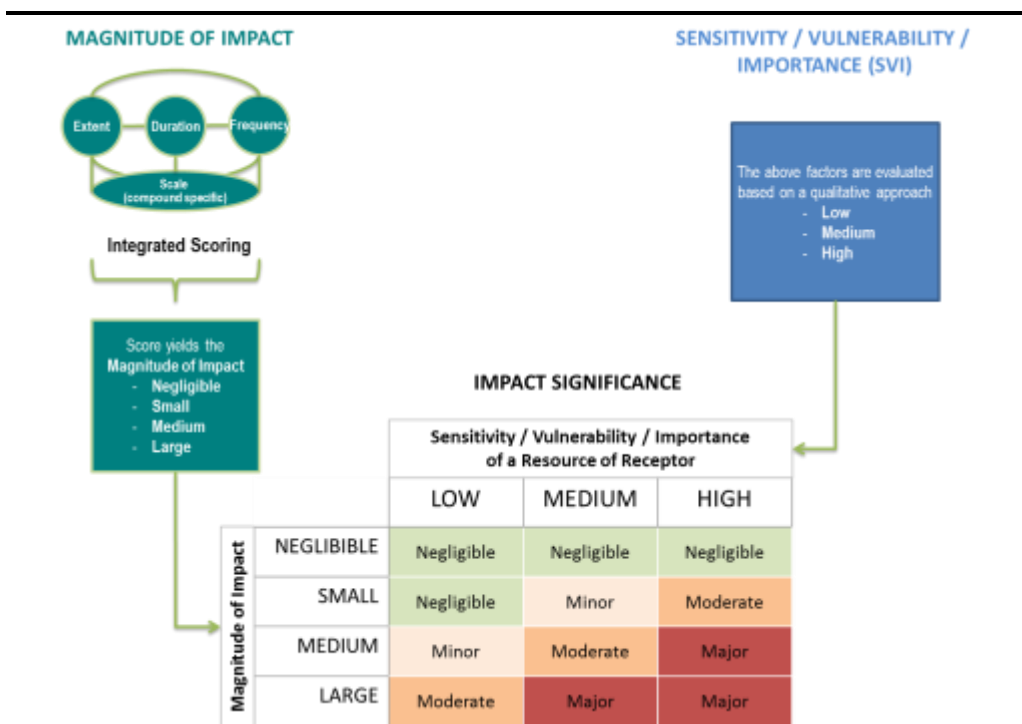
The aim of the ESIA process is to identify hazards and risks, and where necessary measures that the Project will take to avoid, reduce, mitigate, offset or compensate for these.

The underlying philosophy of the impact assessment methodology is that the *Significance* of a particular impact depends on the interplay of the *Magnitude* of the impact and the *Sensitivity/Vulnerability/Importance (SVI)* of a receptor. Whilst numerous quantitative and qualitative factors are included within this assessment, the overall resulting *Significance* is then expressed as being *Negligible, Minor, Moderate* or *Major*. This level of *Significance* is crucial for determining the extent to which further mitigation measures, if any, are required.

A significant impact is an impact that has a major effect on the resource / receptor according to the results of the assessment process. Significant Impacts require mitigation measures suitable to reduce the impact to a moderate impact category.

The general impact assessment methodology is depicted in *Figure 5.1-1*.

Figure 5.1-1 Overview of the assessment of impact Significance



Where impacts of major *Significance* are identified, a hierarchy of options for mitigation needs to be explored as follows:

1. **Avoid**– avoiding or reducing the impact source through the design of the Project;

2. **Minimize** – minimising the impact through implementing control measures at site or through implementing control measures at receptor;
3. **Mitigate** – mitigate the impact through repair, restoration or reinstatement measures;
4. **Compensate or Offset in Kind; Compensate Through Other Means** - compensation for loss, damage and disturbance in case other mitigation approaches are either not possible or fully effective.

Additionally recommended mitigation measures identified during the ESIA process are included in the Environmental and Social Management Plan (ESMP).

5.2 ENVIRONMENTAL IMPACTS

5.2.1 Overview of environmental impacts

The main facilities and infrastructure to be constructed at the FFD stage are gas well clusters, UKPG-31 expansion facilities, high-voltage power transmission lines, pipelines (gas- and methanol pipelines) with pig launchers and pig receivers, roads, bridges, and quarries.

During operation, the level of environmental impacts will be relatively low compared to the construction period.

There were no major impacts identified, associated with the construction or operation of the project facilities and infrastructure.

5.2.2 Impact on ambient air quality

Pollution of atmospheric air has a potential to be caused by any activity during the construction stage, since it will be associated with construction equipment and vehicles emissions. During the operational phase sources of emissions are limited to wells and UKPG.

The main air pollutants both during the construction and operational phase are nitrogen oxides, carbon oxides, dust, sulphur dioxide, kerosene vapours, soot particles, hydrocarbons, xylenes and methanol. The air emissions are going to be below the defined threshold values in all cases and will mainly exert *negligible* and *minor* impacts on the receptors.

During the operational phase UKPG-31 operation results in *moderate* impact through NO₂ and CO emissions.

During the construction of well clusters, their drilling and completion a *moderate* impact through NO₂, CO, Xylene and particulate matter emissions occurs.

The Embedded Measures are sufficient to control the impacts from air emissions.

5.2.3 *GHG emissions*

According to the official RF GHG Inventory, the total GHG emissions within the 1990 accounted for 3436.46 million tonnes of CO₂ equivalent, and the national target for the year 2020 is 2,577.35 million tonnes of CO₂ equivalent (at 75% of 1990 value).

The total GHG emissions of the Project are about 0.23 million tonnes of CO₂ equivalent, which accounts for less than 0.01% of the national GHG target – and which is significantly less than the contribution in 2014.

The impacts through GHG emissions are assessed to be *moderate* for the construction phase and *minor* for the operational phase.

A number of GHG emission reduction measures are already integrated into the design and / or have been additionally implemented. No further mitigation measures are necessary and seem feasible.

5.2.4 *Noise impacts*

The Project implementation will be associated with increased noise pollution of the area surrounding the construction sites and the facilities.

All impacts associated with noise are assessed as *negligible* or *minor*. No further mitigation measures apply to noise pollution.

5.2.5 *Impacts on terrain, geology and hydrogeology*

Geological impacts will be associated with geo-mechanical, geochemical, hydrodynamic, and geothermal (impacts on permafrost) processes arising from construction and operation of the Project facilities.

The significance of most impacts on the geological environment and groundwater is assessed as *negligible*.

Moderate geothermal impacts are associated with the construction of gas well clusters and the expansion of the UKPG-31. An alteration of permafrost poses a risk for sustainability of ecosystems, stability and smooth operation of Project facilities. This can lead to secondary permafrost formation, thermal alterations in adjacent landscapes and the sites disturbed during construction activities and loss of subsoil bearing capacities.

The Embedded Measures are sufficient to control the potential alterations to permafrost systems and no additional measures are deemed necessary.

Moderate hydrodynamic impacts are associated with operation of motor roads and bridges (alteration of surface run-off conditions along embankments) and water injection wells (alteration of thermal regime of groundwater). The Embedded Measures are sufficient to control the hazards associated with these impacts.

Finally *moderate* geothermal impacts are associated with the operation of gas wells (thermal alterations of ground layers and hazardous geological processes) and water injection wells (cooling of ground layers).

These effects were extensively evaluated during the design phase and hence Embedded Measures are sufficient to control the hazards associated with these impacts.

5.2.6 *Impacts on surface water*

All impacts on surface water (Nyudya Yesetayakha River, Ngarka Yesetayakha River, Nedormayakha River and a number of nameless creeks and temporary water streams) are of *negligible* significance. No additional mitigation measures are required.

5.2.7 *Impacts on topsoil and vegetation cover*

Construction of the Project facilities will affect soils and natural plant associations over an area of 815 ha in total.

The effect will mainly be in the form of the loss of physical vegetation cover. The significance of the experienced impacts is higher during the Construction phase due to extensive earthworks taking place.

The maximum impact from TVC loss is of *moderate* significance, as long as no Tundra environments with protected plant species are affected.

The following protected species are potentially present in the Project Area of Influence (however so far have never been identified in the Project Area): *Corallorhiza trifida*, *Nuphar pumila*, *Dactylorhiza fuchsia subsp. Hebridensis*, *Lycopodiella inundata*, *Aconitum baicalense*, *Aster sibirica*, *Dactylorhiza sudetica*, *Goodyera repens*, *Hammarbia paludos*.

In order to ensure, that in future operations no area with protected species is affected, it shall be confirmed for all future land lease areas that none of the listed species are present in the proposed construction corridors.

The activities are intrinsic to the Project and there is no way to further avoid/mitigate these impacts during construction. The analysis of Embedded Measures and existing monitoring shows that no further mitigation/management measures are applicable to manage the impacts from TVC.

5.2.8 *Impacts on flora diversity*

In addition to the impacts on flora diversity through loss of topsoil and vegetation cover (assessed in the previous chapter) impacts on flora diversity are associated with depression of vegetation through NO₂ and SO₂ emissions.

The impacts from SO₂ emissions from well construction activities, as well as NO₂ emissions from UKPG operations are of *moderate* significance. All other impacts with the effect of depression of vegetation are of *minor* significance. The introduction of invasive species is considered to be of *negligible* impact

No further mitigation/management measures are applicable to manage this impact.

5.2.9 *Impacts on fauna diversity*

The density of baseline population of most species in the Project Area of Influence is lower compared to the neighbouring areas unaffected by industrial development. This difference is primarily caused by disturbance and destruction of vegetative cover during construction and operation of gas

production facilities over the years before the commencement of the ZAO Achimgaz Project in 2008.

The loss of wildlife habitat associated with construction of facilities on the long-lease areas as well as loss of biodiversity due to construction activity, is associated with a *moderate* (forests, woodlands and Tundra) or *minor* (flat hummocky bogs, floodplains, artificial complexes) impact.

All other potential impacts on fauna biodiversity are of *minor* or *negligible* significance.

The protected species listed as potentially being present in the wider area have so far not been identified in the Project Area. In order to ensure, that in future operations no area with protected species is affected, it shall be confirmed for all future land lease areas that none of the listed species (*Salamandrella keyserlingii*, *Lanius excubitor*, *Haliaeetus albicilla*, *Melanitta fusca*, *Cygnus cygnus*, *Clangula hyemalis*, *Numenius arquata*, *Lutra lutra*, *Rangifer tarandus*) inhabit the proposed construction corridors.

The activities are intrinsic to the Project and there is no way to further avoid/mitigate these impacts during construction.

5.3 SOCIAL IMPACTS

5.3.1 Overview of social impacts

Company's activities that may lead to socioeconomic changes were divided into 5 groups. The first one ("Construction and operation of the Project infrastructure") covers all on-site Project activities, including personnel on site. Other four groups of changes focus on other important Company activities (that may be called indirect as they are not included in the list of on-site activities). These groups of activities include social and employment policy, contracting workforce, budget revenues, and social charitable projects.

5.3.2 Socioeconomic and livelihood impacts

Increased income opportunities from direct and indirect job creation

As of 10.12.2013, ZAO Achimgaz employed 304 workers (and four employees at the Moscow Office of the Company). Regular staff numbers for 2013 were 324 workers. Engineers and technicians prevail in the current personnel structure (55% versus 45% comprised by workers).

The Project implementation provides for continuous increase of number of employees following the increase in the number of wells.

Most employees (88% of personnel) are residents of Novy Urengoy. The remaining staff is from other YNAO municipalities or other regions of Russia.

The Project is characterised by simultaneous progress of construction and operation phases. Construction is carried out by ZAO Achimgaz contractors and will be completed in 2020. In 2013, the major part of construction activities was carried out by seven contractors. These contractors are local companies registered in Novy Urengoy or local branches of Russian companies. In 2013,

seven main contractors employed approximately 330 workers. Construction workers operate on a rotational scheme.

This impact has been assessed as a positive both direct and indirect impact with benefits to be received at a local level. Creation of new well-paid jobs will facilitate development of the local services sector.

Increased level of revenues to local budgets and local economy

The Project implementation will have a positive influence on the local economic situation in Novy Urengoy and Purovsky District. This impact is associated with increased tax revenues of the city budget, increasing wages, investments in the City and District economy, and a number of other payments made by the Company. The indirect impact from development of associated sectors is also very important.

Tax payments

The budget of YNAO will receive on average of 64% of all tax payments; the federal budget will receive 35% of all tax payments. The budget of Novy Urengoy will at an average receive 1.4% of all tax payments during the period from 2013 to 2020.

Social transfers

Wages in the Russian Federation are subject to deductions of compulsory social transfers. These are accumulated in special social funds operating in the territory of municipalities. Total social transfers are equivalent to 34.7% of the wage of each worker. The total social transfer will increase proportionally with the growth of the number of employees.

Wage fund

The increase of income of the local community and the augmentation of the city's wage fund is one of the most significant positive economic impacts on the economy of Novy Urengoy.

The wage fund of new jobs created by the Company (i.e. the sum of average annual wages of new employees) will be approximately 170 million RUB (based on current prices). At the FFD stage, the total wages of the Company employees will be around 940 million RUB.

As mentioned above, increased incomes of the local community will be followed by the increase in the amount of tax contributions to the budgets of Novy Urengoy and the YNAO (resulting from increased personal income tax revenues). In addition, the increase in the wage fund and the money supply in the city economy will stimulate development of the tertiary sector through increasing purchasing power of the inhabitants.

Overall inflow of cash into the local economy from the Project implementation and the multiplier effect

In addition to direct contributions to the municipal, regional and federal economy, the Project will also stimulate indirect contributions. The increase in incomes of the local community and, consequently, in purchasing power, will facilitate growth of local small and medium-sized businesses.

Support to Local Vulnerable Groups and Social Infrastructure

ZAO Achimgaz plays an active role in implementation of social charitable projects in Purovsky District, neighbouring Nadymsky District (although no

professional activities are conducted there), and the YNAO Region in general. The Company concludes annual agreements on socioeconomic cooperation with the YNAO Region and Purovsky District administrations.

ZAO Achimgaz supports various vulnerable groups of population in Purovsky District and the YNAO, including:

- Indigenous people of Purovsky District;
- Drug-dependant persons of YNAO;
- Deprived and handicapped children in YNAO;
- Veterans in YNAO;
- Visually impaired children in Purovsky District;
- Troubled Teens' of Purovsky District;
- Handicapped persons in Purovsky District.

The Company makes large investments in social infrastructure projects, including development of nursery facilities, schools and community centres in rural areas, and sports facilities. The Company's support is focused on the social infrastructure facilities in Samburg and Urengoy, i.e. the nearest settlements to the Project Area.

One of the main charity projects of the Company is the financing of men's and women's volleyball clubs "Fakel" (each club received 50 million RUB in 2012 and 2013).

Possible influence on indigenous minorities of the North

The initial impact on indigenous people had taken place more than 40 years before ZAO Achimgaz has started its activities. The Project Area is located on the lands of OAO Sovkhoz Purovsky. These lands were the areas of traditional use of indigenous people having the legal protection status. According to available information, as a result of previous activities of oil and gas companies, indigenous people have moved with their reindeer herds to a considerable distance and do not currently conduct any traditional activities within the Project Area. Thus currently ZAO Achimgaz operations have no direct impact on the indigenous people.

As is common practice for the oil and gas sector in the Urengoy region, the Company is making compensation payments to the associations of the indigenous minorities of the North. The compensation under all current land lease contracts is determined at 25.8 million RUB.

In addition to compensation payments, ZAO Achimgaz provides charity support for indigenous peoples. The Company supports events and activities of the Association of Indigenous Peoples of YNAO (Public Organisation "Yamal for Future Generations!"). In 2012–2013, the total payments for support activities and projects were about 35 million RUB.

Impacts on ecosystem services

ZAO Achimgaz activities both depend and have an impact on ecosystem services.

ZAO Achimgaz provisioning service dependencies include use of water for potable water supply for the staff, and for certain construction and operation processes. ZAO Achimgaz regulating service dependencies (the same as for

other major part of oil and gas companies functioning in the region) are typically more indirect, and include a range of physical functions provided by vegetation and habitats such as erosion control and water filtration.

Potential impacts arise through depleting, displacing or polluting individual organisms and habitats that give rise to the ecosystem services.

No beneficiaries of the livelihoods and cultural ecosystem services are living within the Project Area. Because of the absence of beneficiaries potential impacts on ecosystem services important for local residents were scoped out and are not assessed.

Archaeological impacts

The chance of archaeological findings during construction of the wells, roads, pipelines and other facilities will always exist, although no presence is known to date, based on a cultural heritage survey commissioned by Achimgaz in 2010. The likelihood of occurrence of valuable archaeological or cultural sites in relative proximity to the Project Area is low.

5.4

ASSESSMENT OF CUMULATIVE IMPACTS

As it has already been discussed, the Project is located within an intensively developed oil & gas exploration and production region of Russia and is just one of numerous gas extracting companies within the Urengoy oil and gas field.

In addition to the ZAO Achimgaz Project the subject Area may experience cumulative impacts due to operation of a number of other entities located in the vicinity.

Expected future activities in the Area of Cumulative Impacts comprise:

- Decrease of GDU gas production activities caused by exploitation of Cenomanian and Valanginian gas-bearing formation;
- Reduction in number of gas treatment plants;
- Joining the gas collecting pipelines in compact groups thus reducing their footprint;
- Construction of boosting compressor stations (BCS) at UKPG sites;
- Further development of the Achimov formation blocks.

Cumulative Impacts on air quality

- Though overall emissions are expected to be reduced, this reduction can be balanced by increased emissions from BCSs, scheduled to be constructed and activities associated with further development of the Achimov formation blocks.
- Impact of ZAO Achimgaz Project will provide for minor part of all potential air pollution. Area of influence of the Project's facilities will not exceed 2 km¹. Where cumulative impact can take place (e.g. UKPG-

¹As stated in the Project design documentation and confirmed by computer simulations.

5 and well clusters Nos. 27, 30 and 32 etc.), Project facilities' input to overall impact is expected to be minor.

Cumulative Impacts on subsoil and groundwater

- The most sizable cumulative impacts of activities on the geological environment are associated with the extraction of hydrocarbons from the geological strata, water injection and groundwater intake.
- In the year 2022, all five Achimov Blocks are scheduled to reach the design production levels: 10.8 million tons of unstable condensate by 2024, and gas production at 36.8 bcma. The maximum gas production of the Block 1A will comprise 8 bcma from 113 wells at completion of FFD stage.
- It is obvious that the Project construction and operation of the Achimgaz Block 1A will make only a small contribution to the overall geological impacts by other operators in the Urengoy field.
- The Cenomanian aquifer is widely used in the region for water injection by the oil and gas industry and proved to be reliably insulated from the other (shallower) drinking water aquifers by the Cenomanian gas deposit and regional clay formation¹. Therefore, no cumulative impacts on the underground water quality contained in the drinking water aquifer are anticipated.

Cumulative Impacts on surface water

- To date there is a number of facilities (beyond those mentioned above related to the Project) that are affecting the surface water bodies.
- The expected effect is the disturbance of river floodplains and beds. This impact will be more noticeable during the expected pipeline decommissioning works related to the decrease of gas production activities in the Area, and will become less significant after the end of these works when the remaining pipelines will be bundled to reduce their footprint.
- Despite the decreasing gas production, intensive operations within the Area of Cumulative Impacts will continue, and surface runoff from bridges and other facilities will potentially impact the watercourses.
- It is noteworthy that the proportional contribution of ZAO Achimgaz to the overall cumulative impact is deemed to be extremely low.

Impacts on the ecology

Terrain

Terrain alterations are associated with the construction of new facilities, embankments, landfills, and linear infrastructure. Though the impact of each individual facility can be assessed as *minor* and local, the overall land disturbance achieve sizable values. To date the direct footprint of the oil and gas extracting activities within the Urengoy gas field is about 23,800 ha.

Topsoil, habitats, biodiversity

¹ <http://promros.ru/magazine/2012/apr/555.phtml>

- Due to the nature of gas extracting activities the significant loss of habitats and fauna diversity occurred during the first years of Urengoy field development. To date undisturbed habitats are located in tessellated patterns within the area, and development of future projects will further reduce their areas.
- The input of the Project will provide for about 4% of the overall footprint within the gas field, which is not significant, but still a noticeable area (in terms of ha).

Impacts on social components

- Negative influence on indigenous people is a part of cumulative impacts caused by oil and gas companies whose facilities are located within the lands of traditional use by indigenous peoples. This impact has been already observed for more than 40 years. Input of the Project can be assessed as low.
- Negative impacts on ecosystem services are also part of the cumulative impacts of the oil and gas companies of the whole region. Gas extracting activities also provided for direct impacts on provision ecosystem services and mainly indirect impacts on regulating ecosystem services.
- Project activities also provide input to positive cumulative impact on local economy. Direct and indirect contribution of the Company to local resident's incomes, local budget and some sectors of local economy are part of similar positive impacts of other oil and gas companies. As a result high rates of local economy growth are observed in Novy Urengoy and partly in Purovsky district, so as high rates of local service sector and of small and medium business.

5.5

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental and Social Management Plan (ESMP) has been developed on the basis of findings of the comprehensive assessment of the Project's environmental and social impacts and aims to ensure effective environmental and social management of the Project. The ESMP has been developed to:

- Extend preventive measures and procedures provided by the Project;
- Enhance positive effects of the Project implementation.

The ESMP covers all activities associated with the Project whether these activities are carried out by the Company's or contractors' personnel.

HEALTH AND SAFETY MANAGEMENT, MEASURES TO ENSURE HEALTH AND SAFETY OF PERSONNEL

ZAO Achimgaz adopted a Health, Safety and Environment (HSE) Policy which outlines the key objectives of the Company's H&S commitments:

- Ensuring health and welfare of staff, contractors, customers, and local communities;
- Compliance with legislation and best practices;
- H&S performance continuous improvement;
- Preventing accidents;
- Encouraging staff H&S competencies.

To meet the Policy commitments ZAO Achimgaz has designed and maintains an H&S management system based on three key elements:

- H&S management system documentation;
- Effective H&S organization capable to implement what is written in the documentation;
- Ensuring a certain level of competence of managers and staff in the field of HSE in accordance with the requirements of specific job / workplace.

These three key elements are inextricably linked.

HEALTH, SAFETY AND ENVIRONMENTAL RISKS OF POTENTIAL NON-ROUTINE SITUATIONS AND ACCIDENTAL EVENTS

Assessment of risks associated with potential incidents at the ZAO Achimgaz facilities was conducted by the Company in accordance with the requirements of the Russian legislation at the Project design stage as part of the Industrial Safety Declaration (ISD) and the Engineering and Technical Civil Defence and Emergency Response Solutions/Measures. The documents were developed by the Russian design institute "TyumenNIIgiprokaz". The correctness of the documentation and the acceptability of identified risks were confirmed by the State Expert Review Authority. In addition to the above, HAZOP procedures were applied during the design process to verify the identified risks.

Based on the assessments of risk, measures for reduction of technical risk were developed as part of the Project design documentation. By the start of the operations all measures provided for in the Project documentation had been implemented.

Development of organisational/ management measures for reduction of incident risk were also based on the above risk assessment documents, Russian regulations, and best international practice. Organisational/ management measures were recorded in various documents of the Achimgaz H&S Management System. Emergency procedures for personnel and emergency response teams were identified in compulsory emergency planning documents, such as the Incident Response Plan (IRP) and the Spill Response Plan (SRP).

The overall accident risk assessment undertaken indicates that social, environmental, and reputational risks of accidents associated with the ZAO Achimgaz operations are acceptable and manageable. Engineering solutions/ decisions and management measures implemented by ZAO Achimgaz to ensure incident-free operation are adequate.

ZAO Achimgaz risk management procedures include the periodic review of the Project risks and the efficacy of the preventive control measures being implemented. As such, these reviews may in future show that additional controls and/or procedures may be warranted and these will then need to be approved by the responsible authorities and implemented as appropriate at that time.

The general population is located outside the zone of potential risk; i.e. nearest residential areas (at Novy Urengoy) are about 30 km from the Project facilities. As such, potential accidents on Project facilities will not pose any risk of major emergency situations resulting in fatalities and damage to health and properties in Novy Urengoy.