



TENGIZCHEVROIL'S 2021 ENVIRONMENTAL PERFORMANCE



TABLE OF CONTENTS

ENVIRONMENTAL MONITORING	4
AIR PROTECTION	7
MANAGING GREENHOUSE GAS EMISSIONS	8
RATIONAL USE OF WATER RESOURCES	9
EFFECTIVE APPROACH IN WASTE MANAGEMENT	10
LAND RECLAMATION PROGRAM PROGRESS.....	12
BIODIVERSITY	13

TENGIZCHEVROIL'S 2021 ENVIRONMENTAL PERFORMANCE

Protecting people and the environment is one of the core values for Tengizchevroil LLP (TCO) for which the Company is constantly setting and achieving higher environmental standards.

TCO's environmental activities are focused on air protection, rational use of water resources, protection of subsoil and land, waste disposal and raising environmental awareness.

The Company's key environmental commitments include minimizing environmental emissions from its operations, supporting the Lower Carbon strategy of Republic of Kazakhstan (RoK), increasing the environmental safety of operations and continuous improvement of its environmental performance.

This brochure provides the overview of TCO's 2021 environmental performance. The following pages demonstrate TCO's high commitment to its values, principles and responsibilities.

ENVIRONMENTAL MONITORING



TCO conducts a comprehensive system of continuous environmental monitoring within its area of operations.

Environmental monitoring includes atmospheric air, water and soil samples that are collected and analyzed in TCO's environmental laboratory against specified thresholds and background conditions to track and proactively manage potential impacts on the environment.

TCO's environmental laboratory is certified and has been operating since 2016 equipped with state-of-the-art technology and equipment.

AIR MONITORING

Good air quality is foundational to environmental protection. And the air monitoring is a core component of TCO's Environmental Industrial Control Program. Continuous monitoring is in place to obtain the information on ambient air quality and proactively evaluate and mitigate potential impacts from the Company's production operations. The air monitoring system enables TCO to plan and implement preventive and mitigative measures to reduce or eliminate environmental impacts to the air surrounding its operations.

TCO carries out several types of air monitoring within its area of operations and Sanitary Protection Zone (SPZ), as well as in rotational village and in the village of Zhana Karaton.

UNDERPLUME MONITORING

Underplume monitoring is performed to assess the potential impact of emission sources from TCO production facilities.

TCO monitors the following areas near the flare stacks:

- 1 point upwind from the plants at a distance of 16 kilometers in all directions, except for the west (in the west direction the point is at 8-10 km depending on accessibility of the road);
- 9 points downwind from the plants at the distances of 0.5, 1, 2, 3, 4, 6, 8, 10, 15 kilometers.

AIR MONITORING AT THE BORDER OF THE SANITARY PROTECTION ZONE

There are 11 mobile posts with fixed coordinates at the border of the TCO SPZ that are used to assess the level of atmospheric air pollution and to comply with the established norms. On an ongoing basis, observations are made on the following ingredients: nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), hydrogen sulfide (H_2S), hydrocarbons (CH) and elemental sulfur (S). The results of observations at the border of the TCO sanitary protection zone for 2020-2021 showed no exceedance of maximum allowable concentrations.



AIR MONITORING AT EMISSION SOURCES

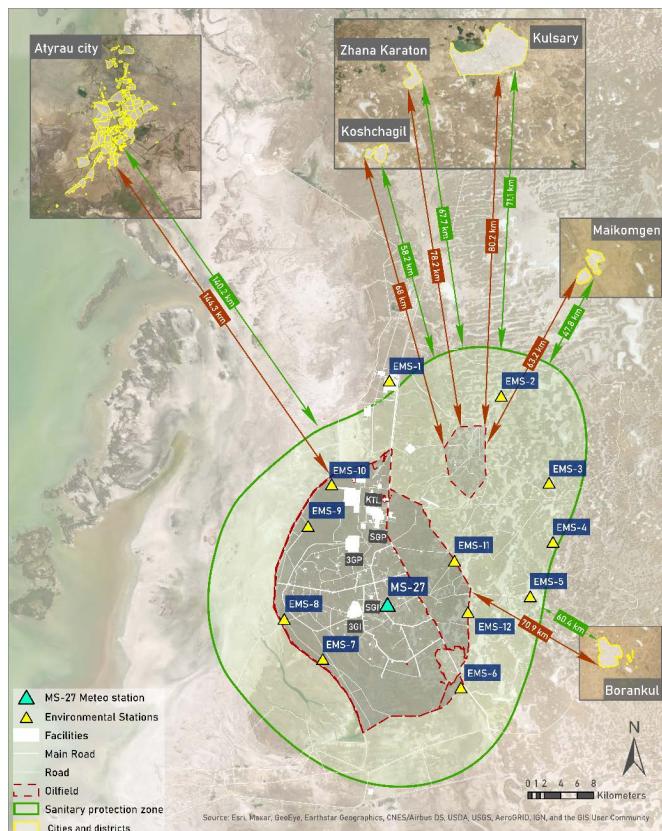
TCO also performs regular monitoring at emission sources at specially equipped sampling points to monitor compliance with permitted limits. Vent gases are monitored using certified portable gas analyzers that register the concentrations of carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x) and the temperature, velocity and volume of the gas-air mixture.

ENVIRONMENTAL MONITORING STATIONS

TCO maintains a special air monitoring system comprised of 12 automated Environmental Monitoring Stations (EMS) within its area of operations and along the perimeter of the SPZ. The EMS stations are equipped with modern analyzers capable of detecting concentrations of hydrogen sulfide (H_2S), carbon monoxide (CO), nitrogen oxides (NO , NO_2), methane (CH_4) and sulfur dioxide (SO_2). Each EMS is automated and operates 24 hours a day.

AIR MONITORING AT SETTLEMENTS AND IN ZHANA KARATON

Air samples are collected 4 times a day in TCO rotational village and on weekly basis in village of Zhana Karaton. TCO facilities do not have impact on the air quality of abovementioned areas due to the remote locations of these settlements.

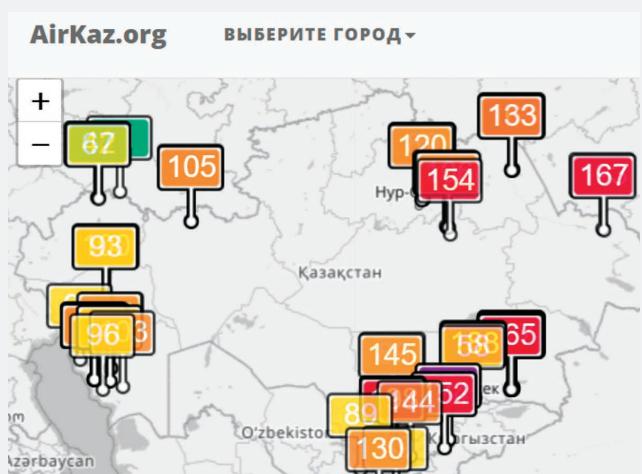


Map of EMS locations

CASE STUDY FOR EMS DATA SHARING

As part of the Company's commitments in the Roadmap for an Integrated Solution to Environmental Issues in Atyrau Oblast, TCO initiated real-time air quality data sharing from four EMS stations.

The concentrations of hydrogen sulfide (H_2S), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen oxides (NO, NO_2), methane (CH_4) and meteorological parameters are averaged and transmitted online to "Kazhydromet" RSE every 30 minutes. The EMS data from these four stations are available on the AirKZ mobile application and are shown at the interactive map of "Kazhydromet" RSE.



GROUNDWATER MONITORING

Groundwater monitoring is completed through a large network of observation wells, including 125 observation wells at Tengiz and Korolev fields, and 11 background monitoring wells located away from operational facilities.

In 2021, TCO completed the project of an upgrade of the existing groundwater monitoring network to improve sampling reliability.



MONITORING OF SOIL

There are 55 points where soil samples are drawn for further analysis, the result of which helps to ensure the control over the soil conditions within TCO's industrial areas. Soil samples are analyzed in accordance with the approved methodology in laboratories accredited in compliance with the legislation of RoK.

WASTEWATER MONITORING

TCO monitors wastewaters on a regular basis to ensure the compliance with the established emission limits. Wastewaters are controlled in effluent treatment facilities, evaporation ponds and prior discharging into water injection wells.

Frequency of sampling and analysis complies with the approved program and schedules of analytical control.

To conclude above, a constant monitoring is performed for all environmental components such as air, water, soil, etc.

TCO's environmental monitoring program complies with the current environmental regulations.

All data obtained from monitoring is included into reports that are issued regularly under the TCO's Environmental Industrial Control Program.

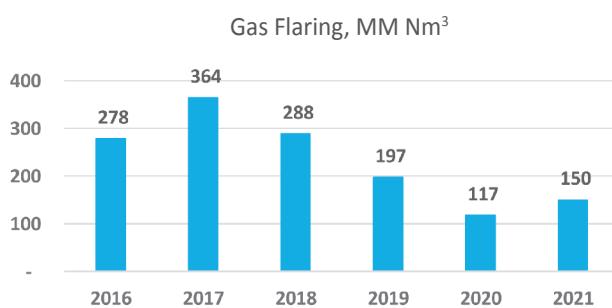
AIR PROTECTION

TCO rigorously complies with legislative requirements of RoK and performs extensive air protection activities through use of state-of-art technologies resulting in the continuous reduction of air emissions while oil production volumes have increased significantly over the years.



During the last 20 years of operation TCO reduced its air emissions intensity by 65% with a corresponding 2.6 volume increase in crude oil production. Such result was achieved by leveraging monitoring and emissions data to invest in major capital projects to improve operational reliability.

GAS FLARING REDUCTION



A flare is a critical safety device used at oil and gas processing plants around the world to ensure safe operation of its equipment. TCO relies on flares during maintenance, repair, start-

up works, shutdowns and also during process upsets resulting from technical malfunctions. Flaring is used when necessary to allow for safe operation and protection of people.

TCO's KTL and Second Generation Plant (SGP) remain as the reliable, efficient and the safest facilities in Kazakhstan as a result of improvements in plant reliability and upgrades of processes and equipment.

TCO eliminated continuous routine flaring of associated gas since 2009 and now 99% of the produced gas is exported or used for Company's internal needs.

Total gas flaring reduction throughout 2020-2021 was achieved by the reduction of technological unavoidable flaring resulting from the following mitigation measures:

- The great example of engineering innovative solution is the upgrade of infrastructure and processes at Sour Gas Injection (SGI) plant by decreasing the well's pressure to reduce technological unavoidable gas flaring without sacrificing productivity.
- Making specific adjustment in the operating conditions for gas plant distillation columns and refrigeration units allowed TCO to reduce volumes of ethane flared from the KTL in 2021 by 94%.
- Transferring propane refrigerant from a production unit to the sales propane pipeline allowed TCO to reduce potential gas flaring in 2021 by 83%.

MANAGING GREENHOUSE GAS EMISSIONS



Looking for ways to reduce Carbon while delivering on the TCO business plan is of a high priority for the Company. TCO is taking a proactive and pragmatic approach underpinned by three buckets of opportunities: operational improvements, Capital investments, and renewable power:

- Operational improvements focus on efficiency gains achieved by changing the operations in a way that maintains operational reliability while reducing TCO's emissions.
- Capital Investments that will result in emission reductions.
- TCO is incorporating renewable power into its operations, consistent with the pace of introduction of renewables penetration in the Western Kazakh grid.

RATIONAL USE OF WATER RESOURCES

TCO is conscious of the social, environmental and economic importance of freshwater and therefore, the Company is committed to rational use of water resources.



Increased water demand due to population and industrial growth has put limitations on the water supply from the Magistralnyi Vodoprovod (MV) line, the main waterline. TCO's goal is not to increase the water consumption volume from MV, despite the growing number of personnel and increase in production capacity due to the construction of Future Growth Project - Wellhead Pressure Management Project (FGP-WPMP).

From 2013 to 2016 TCO commissioned a Waste-water Treatment Facility (WTF) and associated Water Recycling Facilities (WRF) to focus on freshwater conservation and wastewater management.

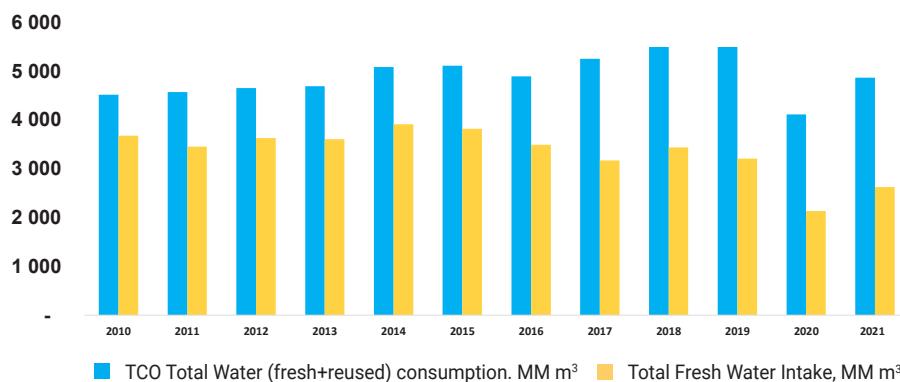
WRF is considered as a major component of TCO's long-term, comprehensive water management program.

At WRF the secondary treatment of wastewater from WTF is carried out by applying reverse osmosis technique. This system produces high quality treated water for operational purposes.

TCO regularly conducts water saving campaigns promoting a water saving culture. By supporting the water conservation initiatives and wastewater management the water reuse at TCO facilities in 2021 made up 46% of total water demand.



RATIONAL WATER USE



EFFECTIVE APPROACH IN WASTE MANAGEMENT

There are more than 60 streams of hazardous and non-hazardous wastes generated at Tengiz, 35 of which are recycled.

TCO's integrated waste management system focuses on waste reduction, reusing and recycling, or more simply the 3R (Reduce, Reuse, Recycle) Program. The 3R Program plays a crucial role affecting how much waste is generated at the source and promotes a recycling culture that brings along numerous benefits. The current waste management practice gives the wastes "a second life", when possible.

The company successfully implemented a color-coding system: for example, black containers are for municipal waste; green containers for collecting paper and cardboard, plastic wastes, etc. These special color-coded and labeled containers are installed for collection and temporary storage of waste at all TCO production sites, camps and other facilities.

The Tengiz Eco Center (TEC) is the heart of waste management operations. The facility was commissioned to enable interim storage, disinfection, recycling, and disposal of waste generated by the company and its business-partners engaged in TCO operations.

It's is worth mentioning Company's efforts in development of waste reuse and recycling. TCO has already successfully diverted more than 50% of its waste to third party waste management facilities. TCO keeps investigating potential suppliers and studying waste management options to identify more waste reuse alternatives. Hazardous waste streams are only sent to companies that have successfully passed through a third party waste stewardship audit and confirmed their waste management capabilities are protective of the environment.

The following are some success stories to describe how wastes were turned into secondary raw materials to give them a new life.



GIVE THE WASTE A SECOND LIFE

The plastic bottles and containers as well as the hard plastic are collected separately and sorted. The plastic waste is delivered to TEC. After delivery, the plastic waste is baled to reduce its size and to make its transportation more effective.

Recyclable plastic can be used as a raw material for producing various goods: bottles and other containers, household goods. Total volume of waste handed over for recycling for period of from 2012 to 2021 is more than 5900 tonnes.

Scrap metal, including off-spec scrap metal.

Currently, scrap metal is shipped to a local company that successfully commissioned production of construction bars. The business partner has already received more than 70,000 tonnes of scrap metal for the period of the last six years.



Paper, Cardboard. The company successfully started recycling cardboard waste in Tengiz in 2014, and in Atyrau the paper and cardboard waste is recycled since 2015. The Program was recently expanded to include paper recycling at Tengiz facilities. Paper waste generated by TCO is now being used to make new corrugated cardboard products. To date, over 5700 tonnes of paper and cardboard waste have been recycled by a TCO business partner.

at designated sites at TEC. Crushed concrete was issued conformity certificates from the State Register and is reused for the company's own needs during process operations. It is also transferred to third parties and local communities for their use. Construction gravel and sand are mixed with crushed concrete and used for road and facility construction. TCO has recycled and reused over 115,000 tonnes of concrete for the period from 2009 to 2021.



Concrete waste, is generated during construction and demolition activities.

Generated concrete waste is transported and crushed

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Spent tires. Expansion of current production volumes and construction of new infrastructure facilities requires operation of more vehicles which has affected the rates at which spent tires are generated. Nowadays, all spent tires are given away by the company for recycling; they are subsequently used to produce floor covers for gyms and outside children playgrounds around residential estates. More than 120 tonnes of such waste have been handed over to business partners for recycling since 2012.

Glass and ceramic. Since 2020 TCO has launched Household glass waste collection project. In order to implement this project, production of specialized containers was arranged at TEC, which were placed throughout the operational areas. 511 tonnes of glass and ceramic waste have been removed and recycled by business partner since the project launch. Crushed glass and ceramic are later sent for production of small architectural forms.

Food and construction waste. To comply with updated regulatory requirements, in 2021 TCO has concluded agreements for collection, removal and recycling of construction, demolition and food wastes:

- Food waste is processed by thermomechanical treatment to produce fertilizer and technical water as final products.
- Construction and demolition waste is sorted into components with release of secondary materials for recycling.



The waste streams discussed above prove TCO's intention and significant efforts in development of waste reuse and recycling. TCO will continue to strive and achieve even better waste management performance to support Green principles outlined by the government of the RoK, thereby ensuring compliance with the RoK regulations and international standards.

LAND RECLAMATION PROGRAM PROGRESS

Reclamation of disturbed land includes collection and removal of garbage, restoration of natural landscape by filling in holes, leveling slopes, correcting terrain irregularities, and creating conditions for the growth of natural vegetation. 22.5 hectares of land were reclaimed and returned to State Agencies in 2021.

OLD WASTE DUMP SITE (OWDS) RECLAMATION SUCCESS STORY

In 2021 TCO successfully executed the reclamation of an Old Waste Dump Site. The old solid municipal waste site had been used before the foundation of TCO and did not meet the regulatory requirements of the Republic of Kazakhstan for waste disposal facilities.

The scope of work on the project consisted of 2 stages:

- Extraction and segregation of 290 000 tonnes of waste and contaminated soil from the legacy dump site. Wastes were transported to the Tengiz Eco Center (TEC) landfills and recyclable materials were handled under TCO's established recycling program.
- Backfilling of the area with 41 000 tonnes of clean soil to restore the site.

The project started in March 2020 and was completed in July 2021 while facing the challenges of COVID-19 including a complete work stoppage for several months and workforce restrictions throughout the project.

Completion of the OWDS not only allowed TCO to meet commitments under the Environmental Protection Plan but also provided long-term benefits to the ecology in the Tengiz Oil Field.

Photo before reclamation:



Photo after reclamation:



BIODIVERSITY

The diversity of ecosystem in Western Kazakhstan provides ecological, recreational, cultural and esthetic value, playing an important role in sustainable development.

During the planning and construction of FGP-WP-MP facilities, successful measures were taken to preserve the habitat and breeding conditions of several fauna species in the region. Prior to the start of the Project's construction works, preconstruction surveys were conducted to avoid or reduce potential impacts on biodiversity in project area.



Construction works are carried out only within the allocated land allotment, transport movement is allowed only on organized roads, land reclamation is carried out after construction completion.

In addition, TCO FGP-WPMP is supporting a conservation project to develop a number of conservation measures that will be implemented to provide breeding conditions for the Sociable Lapwing. The Sociable Lapwing, a bird listed as critically endangered by the International Union for Conservation of Nature (IUCN), breeds on open grassland in the steppes.



In 2021, TCO provided financial support to the Association for the Conservation of Biodiversity of Kazakhstan (ACBK) to initiate a three-year program with the following objectives: working with farmers to safeguard nests at risk from plowing, satellite tracking of these birds, field research to understand changes in their nesting habitat, and raising awareness of the Sociable Lapwing and its conservation status within local Kazakh communities.



More broadly, TCO implements environmental protection programs for the conservation of nests at the Project site. If a nest is found at one of the construction sites, various mitigation measures, which may include suspension of work, are implemented until the eggs hatch and the young birds fledge.

To increase TCO FGP-WPMP staff awareness of the local flora and fauna, a special guidebook identifying their key species was developed. Additionally, more than 100 large banners have been installed across the TCO FGP-WPMP sites for awareness of flora and fauna.

Due to the successful implementation of bird nests management plans and timely response, almost 60% of the discovered nests were active and nesting ended with a successful chick hatch.

STURGEON HATCHERY SUPPORT

As part of the project efforts, an Additional Conservation Action to support Ural-Atyrau Sturgeon Hatchery was implemented to achieve Net Gain for sturgeon. The aim of the program is to reduce the number of adult fish removed from the wild population each year and increase the percentage of wild caught broodstock that are returned to the sea. This is being done by improving the survivorship and productivity of sturgeon broodstock of the Ural-Atyrau Sturgeon Hatchery.



The following efforts led to positive changes: the provision of high quality feed for the broodstock and fry, aerators for oxygenation of rearing ponds, an excavator for external dredging work on the farm ponds. Additionally, TCO purchased and donated winter and summer water chillers for basins with closed water supply.

As a result of the support provided to the Ural-Atyrau Sturgeon Hatchery, the sturgeon broodstock have shown an increase in weight.

HOST NET REMOVAL PROJECT



The project aims to prevent seals and fish from being caught in fishing nets by physically retrieving abandoned nets and to protect and contribute to the growth of endangered marine species such as the Caspian seal and sturgeon. As a result of the efforts of this project around 4300 kg of abandoned nets and 1000 kg of marine debris were collected in one season in 2021.

Since 2014, 878 abandoned fishing nets (20 500 kg) and over 9000 kg of marine debris have been removed from the Caspian Sea, 53 sturgeons and 15 seals were freed from the abandoned nets.







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