ESIA Summary

Construction of a 1,1 Millions TPY cement plant

Mynaral Railway Station
Jambyl Province
Republic of Kazakhstan

Country: Kazakhstan
Project Number:

Department:
Date:

ESIA Summary

1. Introduction

The VICAT Group is one of the French main cement manufacturers also active in the ready-mix concrete and aggregates production. The Group is present in 9 countries (France, USA, Switzerland, Italia, Turkey, Egypt, Senegal, Mali, Kazakhstan).

KazkommertsInvest (KKI) is a Kazakh investment company settled in 2003 with a sole participant Zangar Finance Group from December 2006. KKI developed investments projects in different fields as real estate, oil sector, and other industrial sectors.

The VICAT Group, through its Swiss subsidiary Vigier and KazkommertsInvest agreed in December 2007 to acquire a majority stake (60%) in the project of the Mynaral Cement Plant, KazkommertsInvest keeping the remaining 40% of this project they initiated in 2007.

The project is developed by the Anys Invest Company in which the Project partners have their participation and by the Jambyl Cement Production Company, 100% subsidiary of the Anys Invest Company.

2. Project Description

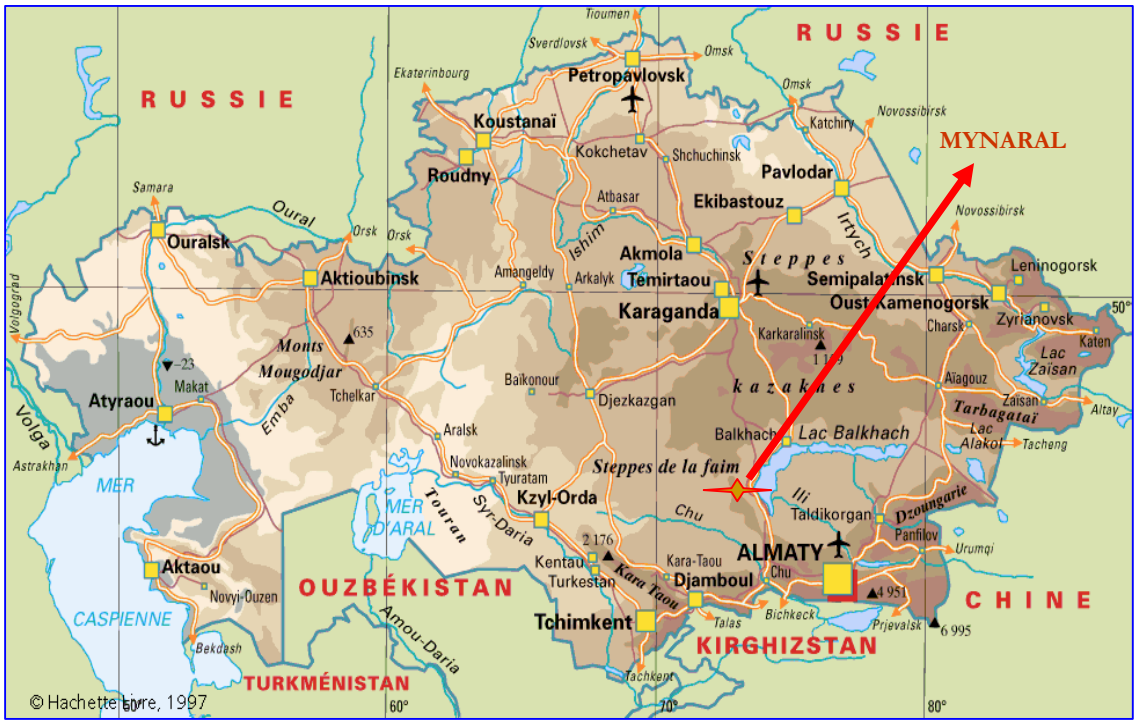
2.1 Plant location

The Mynaral cement plant will be located about 6 km of the Mynaral Railway station in the Jambyl Region. The quarries from which the raw materials (limestone and clay) will be extracted are located 3 km to the plant site.

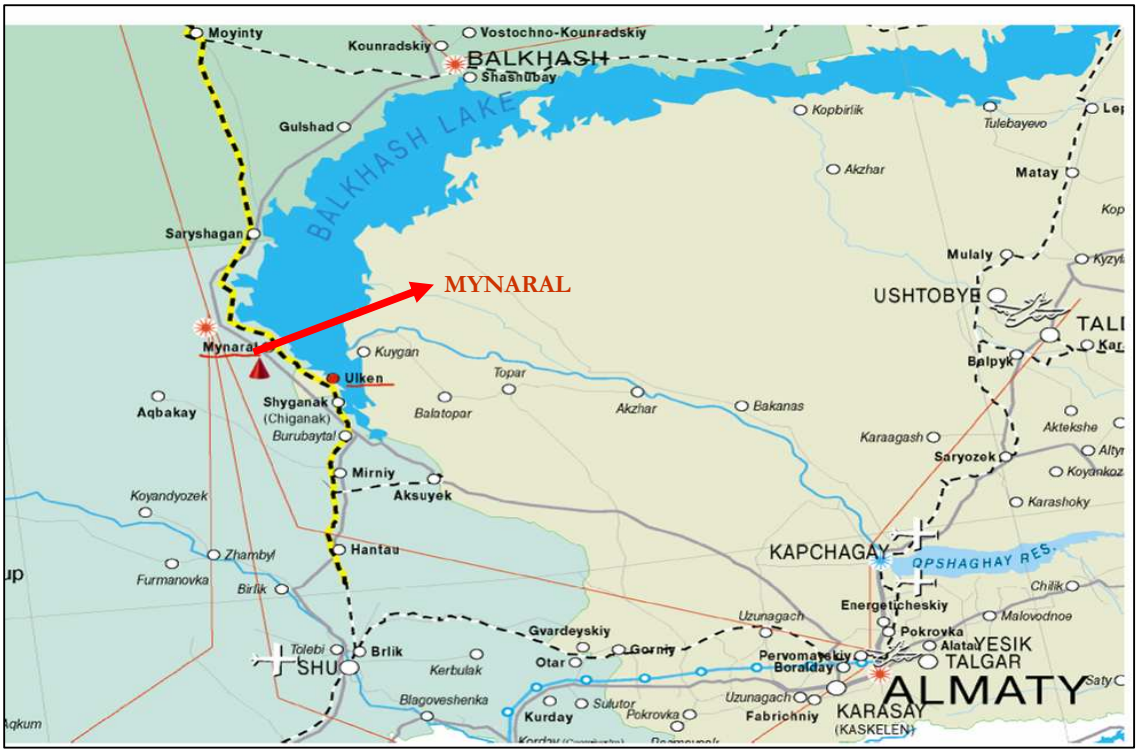
The plant site is established between the main transport infrastructures of the country: the main road Almaty-Karaganda-Astana and the railway Almaty-Chu-Karaganda-Astana. The distance to Almaty, the economic capital of Kazakhstan is 410 km and to Astana, the country capital is 800 km.

The coordinates and altitude of the plant area are given below:

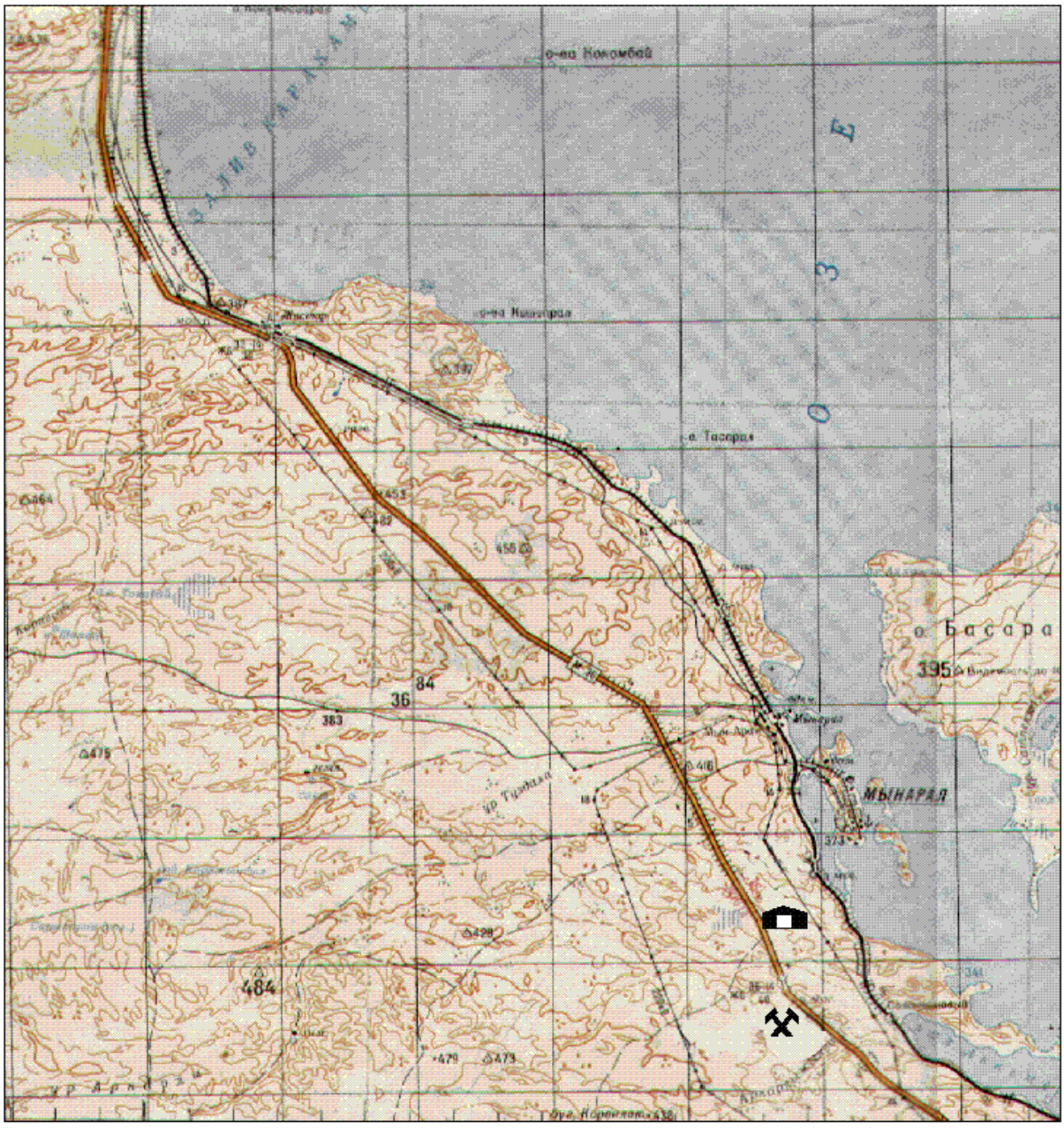
- Northern Latitude : 45°21’50’’
- Eastern Longitude: 73°39’55’’
- Altitude: 353 m.



Map of Kazakhstan



Balkash Lake and Almaty



Layout of cement plant and limestone mining quarry

2.2 Description of the technology

The best available technology, which is the dry process, shall be used for manufacture of cement. Cement manufacturing consists of raw meal, grinding, blending, calcining to form clinker and cement grinding. In short, limestone and other materials containing calcium, silica, aluminum and iron oxides are crushed and milled into the raw meal. This raw meal is blended and heated in the pre-heater to initiate the dissociation of carbonate to calcium oxide and carbon dioxide. The meal then proceeds to the kiln for heating and reaction between calcium oxide and other elements to from calcium silicates and aluminates at a temperature up to 1450 C. The products leave the kiln as a nodular materiel called clinker. The clinker is inter-ground with the gypsum and other additives like slag to a fine product called cement.

The work force requirement for operation of the proposed plant is estimated at 300. A remote camp will be built for the accommodation of the staff working by rotation (estimated to 200 people in the beginning of the operational phase).

2.3 Raw materials and fuels for cement production

The limestone and shale deposits are located 3 km at the plant side. These materials will be delivered into the plant by trucks using a quarry road. Anys Invest was granted to a mining license by the Jambyl Region for limestone and shale extraction. This license has 25 years duration. The already approved limestone and shale reserves correspond to about 100 years of the cement plant operation.

The other raw materials and the fuels are listed below:

- Iron ore: 1% of the raw meal delivered from Jezkazgan (Karaganda Region) by train - about 850 km.
- Sand: 1% of the raw meal delivered from Karaganda Region by truck – about 300 km.
- Coal: delivered from Karaganda by train – about 600 km.
- Gypsum: raw meal (1%) and cement additive – delivered from Taraz by train – about 350 km
- Slag: cement additive - delivered from Karaganda by train – about 600 km.

2.4 Cement manufactured

The plant will manufacture mainly the 2 standardized types of portland cement M400 – D20, and M500. In accordance with the standard GOST 10178-85 applied by the domestic industry, the M500-D0 grade shall contain 95% clinker and 5% gypsum and the M400-D20 grade respectively not less than 80% clinker and 5% gypsum and not more 15% slag.

2.5 Cement market in Kazakhstan

The cement consumption has doubled during the last 5 years due to the high growth of the country development.

The cement consumption for 2007 is estimated to be around 7,5 millions tones. Due to a domestic production limited to 4,2 millions tones, the import covered 40% of the domestic consumption in 2007. The cement consumption, the domestic production and the imported volumes for the previous years are given below:

Thousand tons	2 004	2 005	2 006	2 007
Production	2 996	3 474	3 899	4 256
Import	982	1 662	2 467	3 244
Total Consumption	3 978	5 136	6 366	7 500

The domestic production is provided by 5 main outdated cement plants built during the soviet era using wet process.

The market trends predict a contraction of the cement market during the next year due to the ongoing financial crisis in Kazakhstan and a new sustained increase that will result in a market consumption exceeding 10 millions tons after 2010.

With the important level of import generating high cement market prices and the market trends above-mentioned, the proposed plant construction is one of the greenfields projects developed currently in Kazakhstan in order to increase the domestic production.

The proposed plant will take advantage of its preferential location close to Almaty, the largest city of the country which is the first regional cement sub-market of the country. The targeted market area also includes Astana, the quickly developing new capital, the center and south of the country.

2.6 Utilities

The power for the proposed plant will delivered from the Ulken substation 500 kV/220 kV installed on the national grid operated by KEGOC, the national grid operator. The project includes the construction of a 36 km power high voltage line to the plant, where the power will be delivered to a main substation equipped with a unitary 25 MVA capacity 6,6 kV/220 kV transformers.

The water supply will be provided from the Balkhash Lake by a water pumping station and a 3 km water line. The total requirement for the project including industrial and domestic needs is around 300 m3/day.

No wastewater is generated from process. The only industrial wastewater will be produced by the maintenance warehouses that will be equipped with grease separator. The domestic wastewater from the plant and from the remote camp will be treated in a sewage treatment plant with an estimated capacity of 300 m3/day. The treated effluent will be disposed in evaporation lagoons in order to avoid discharge in the Balkhash Lake.

3. Policy, Legal and Administrative Framework

The ESIA summary for the proposed cement project has been carried out within the framework of local, national and international environmental regulations. The legislative framework applicable to the proposed project is governed by the Republic of Kazakhstan and the International Finance Corporation (IFC).

3.1 Regulatory Framework of the Republic of Kazakhstan

Kazakhstan adopted its constitution on 28th January 1993 which provides to the citizens the right to an environment favorable to the life and the health.

The legislative and regulatory framework for the environment is also established on the following documents:

- The Ecological Code adopted on 9th January 2007.
- The health protection law adopted on 7th of July 1996 and modified on 11th January 2007.
- The law about sanitary and epidemiological welfare of the population adopted on 4th of December 2002.
- The law About Emergency situations of natural and technogenic character adopted on 5th of July1996.
- The Water Code adopted on 31st March 1993.
- The Forest Code adopted on 23rd January 1993
- The Code for the subsoil use adopted on 13rd May 1992.

According to the "Instructions on influence assessing of the planned economic and other activity on environment at working out of the preplanned, planned, predesign and design documentation", confirmed by the order of the Minister for the Environment Protection, dated 28th of June 2007, the preliminary ESIA has to be approved by the Ministry of Environment Protection at the project starting and a final ESIA has to be approved before the production setting up.

The monitoring to be included in the final ESIA will be managed by the territorial direction of the Environment Protection for the Jambyl Province.

Anys Invest has already submitted to the Ministry for Environment Protection the preliminary ESIA, which is now under approval. For the preliminary ESIA preparation, Anys Invest contracted Ecoterra, an engineering company certified by the Ministry of Environment Protection.

3.2 3IFC/World Bank Guidelines

The proposed cement project falls under category A as per IFC Performance Standards and its procedures for project appraisals. The WB and IFC provide detailed guidelines for the EA process. As of April 30, 2007, new versions of the World Bank Environmental, Health and Safety Guidelines (EHS) are in use. The EHS Guidelines also include sector specific:

- EHS Guidelines for Cement and Lime Manufacturing
- EHS Guidelines for Construction Material Extraction

In addition, IFC's eight Performance Standards, viz., Social and Environmental Assessment and Management System; Labour and Working Conditions; Pollution Prevention and Abatement; Community Health, |Safety and Security; Land Acquisition and Involuntary Resettlement; Biodiversity Conservation and Sustainable Natural resource Management; Indigenous People: and Cultural Heritage, will be adhered to throughout the operation of the project.

4. Description of the Project Environment

In order to assess the baseline environmental status in the study area around the proposed project area, a preliminary ESIA as above mentioned (cf. 3.1) was performed in the end of 2007 and the results of this assessment were used for the preparation of this document. The environmental components studied include:

- Physical/Chemical components: Physiography, Geology, Geomorphology, Hydrometeorology, Hydrogeology, Surface and Ground water resources, Climatology, Meteorology, Ambient Air Quality, Noise Levels and Soil Quality,
- Land us, archeology and cultural heritage,
- Biological environment: Flora and Fauna
- Socio-Economic components: Demography, agricultural system, transportation networks and other infrastructure like water supply, health status and employment of the local population.

4.1 Topography and drainage

The topography of the site and its vicinity include small bald mountain, saline soils and dry-type playa. The site for designed raw materials quarry extraction complex and cement plant is chosen successfully enough from the point of view of weak population of the territory, availability of main transport arteries and nearness of water source - Balkhash Lake. Water supply is provided from Lake Balkhash. All technological decisions on water supply are accepted and developed according to the norms, rules, standards and corresponding standard documents of the Republic of Kazakhstan. In addition, it will be rainwater drainage at the site.

4.2 Climate

The climate has sharply expressed deserted-continental character, with dry hot summer, cold little snow winter and strong winds. The annual amplitude of fluctuations in temperature makes 80 °C, and the temperature of July reaches 43 °C, and minimum January-40 °C. The mid-annual temperature fluctuates from +5,4 °C to +8,2 °C. The annual sum of atmospheric precipitation averages 127 mm, its greatest level- 220 mm, the least-59 mm (tab. 5.2). During the cold period of a year (November - March) there are average 58 mm of precipitations, during warm time of a year - 69 mm. The greatest monthly quantity of precipitation falls in December, the least - in September.

4.3 Hydrology

Constant superficial waterways on the explored territory are absent. There are only several dry channels, deeply located in the parental material. The origin of these channels was caused by the action of temporary water currents and drying up streams. The overwhelming majority of them have current direction towards the Lake Balkhash. During the spring-and-summer period, flood and storm waters get to lake water area through these channels.
The main water body on the considered territory is the Lake Balkhash, located more than 2 km to the east of limestone quarry and projected cement plant.

4.4 Quality of water

Water coming through water pipeline from the Lake Balkhash is considered a water supply source for ensuring of designed needs in technical and drinking water at the projected cement plant. Utility and drinking water supply of industrial objects can be carried out due to shallow waters of the Lake Balkhash which quality is close to the requirements of GOST 2874-82 for drinking water. Quality of the underground waters, extended near to the considered objects mismatches requirements of the above mentioned Standards for water, because of their high mineralization.

4.5 Quality of air

The executed survey has shown, that concentration NO2, SO2, CO and the weighed substances reflect a baseline condition of a surface layer of atmosphere in the territory of projected cement plant. It is necessary to notice, that before construction of cement plant and quarrying of lime-pit, the territory almost did not experience the anthropogenous influence. The screening content in a surface layer of atmosphere, heavy metals in soils and plants remained at environmental level.

4.6 Sound level

At performance of the technological decisions and actions provided by the project for protection, the noise level at industrial sites will not exceed the admissible sanitary norms of the Republic of Kazakhstan (SN № 1), tab. 7.10.

Table 7.10. Sanitary norms of admissible noise levels at workplaces

Workplace	Noise level, decibel
1. Management offices, working rooms	60
2. Control offices with phone working connection	65
3. Laboratory for experimental works, rooms for noisy aggregates, Calculating machines	75
4. Constant working places in production facilities (except of it. 1-3) and the territories of industrial factories	80

The following measures are accepted for each source of noise for the purpose of noise pollution reduction.
(1) On conditions that the rooms meets the requirements of production process.
To choose the quiet equipment having the high production accuracy and high qualities of assembling.
(2) It is necessary to consider the equipment foundation for vibration isolation and vibration devocalizations, as at work of the equipment there is a vibrating noise.
(3) Inlet and outlet of air compressor, the fan etc. should be equipped by mufflers.
(4) To construct the soundproofed offices for people on duty at stationary post.
(5) To use building and structures for reduction of sound wave transmission.

4.7 Ecology / Flora and fauna

The flora and fauna of natural landscapes is extensive and various. The flora of the area is more than 3 thousand kinds.

A considerable species diversity of terricole vertebrates, birds, mammals and reptiles in the adjoining, to the territory of cement plant construction, areas is caused by a variety of Pribalkhash landscapes. At the same time, the content and number of animals in reorganized habitats of the developed area is considerably lower than in adjoining areas. It arouses concern and necessity to organize monitoring over fauna condition. The majority of migrating birds fly by transit over explored territory, so the civil works do not influence on them.

The growth of the territory is characterized by homogeneous spatial structure, poverty of flora and low level of biodiversity that is caused by natural-climatic features. Characteristic feature of

growth - monotony of vegetative communities, prevailing on the areas and rather poor flora content of vascular plants.

4.8 Cultural, Historical and Archaeological Features

No visible archeological remains, which have scientific, cultural, public, economic, ethnic, and historic significances, have been observed in the area. The risk value pf both the plant and the quarries is very low, where no significant observable archaeological evidence is found. The sites have no archeological importance. However, Anys Invest will take care about these issues in relation with the local authorities and the communities.

4.9 Socio-economic scenario of the area

Population/Demography

The plant is located in the Moyinkum District part of the Jambyl Province. The Jambyl Province is one of the 16 provinces of countries (including the cities of Astana and Almaty that benefit of a special status).

Area	Superficy (km2)	Population (2007) – thousands inhabitants
Republic of Kazakhstan	2717300	15340
Jambyl Province	144,4	1013
Mojynkum District	50,2	32,1

As the Mojynkum district includes a large part of the Bekbakdala desert territory, the district population density is very low (0,6 hab./km2), when the population density is respectively 7 hab./km2 for the Jambyl Province and 5,5 for the country.

The estimated population of the Mynaral village is 1500 people. They are ethnically in majority kazakhs.

The main parameters of the population development for the country and the Jambyl province are given below:

Parameter	Unit	Kazakhstan (estimation 2008)	Jambyl Province (2007)
Population growth rate	% of the total population	0,374	0,75
Birth rate	births/1,000 population	16,44	24,52
Death rate	deaths/1,000 population	9,39	8,84
Net migration rate	migrant(s)/1,000 population	-3,31	-3,73
Infant mortality rate	deaths/1,000 live births	14,4	14,4

The most common diseases affected the local population are the tuberculosis, the syphilis and other intestinal and respiratory infections.

Employment

The Jambyl Province represents less than 2% in the Country industrial production, which is dominated by the oil and gas and mining sectors. The main industrial activities in the Jambyl province are the extraction and production of phosphates and ferroalloys. The agricultural sector is well developed due to favorable climate conditions in the south of the Province.

Due to a lower development level, the Jambyl Province is one of the last country provinces, the local budget of which is receiving subsidies from the national budget.

The population of the Mojynkum district is almost exclusively rural. In the Mynaral village, the agricultural activities are fishing and breeding. The railway station of Mynaral is also a local source of employment.

The level of unemployment is estimated to 7,3% in the country and 8% in the Jambyl Province. In July 2007, the official figure for unemployed people in the Mojynkum district was 236.

Income

According to the national statistics, the average income in the Jambyl Province in May 2008 is estimated to 35132 KZT (equivalent to 290 USD) thus 37% less than the average income for the country (55422 KZT equivalent to 458 USD).

In 2006, the incidence of poverty is estimated to 23,6 in the Jambyl Province when this ratio is 18,2 for the country. In May 2008, the subsistence minimum is respectively estimated to 10772 KZT (equivalent to 89 USD) in the Jambyl Province and to 12004 KZT in the Country (equivalent to 99 USD).

5. Project alternatives

Due to the location of the limestone and shale deposits along the main Almaty-Astana motorway and close to the main Almaty-Shu-Karaganda-Astana railway with the immediate vicinity of the Mynaral railway station, the decision regarding the plant locations depended only on the access from the motorway and the railway, the quality of the plots and its distance to the village. The site is benefiting also of the proximity of the KEGOC Ulken Main Substation for the power supply.

The distances between the selected plant site and the other area places are:

- 4,5 km from the limestone and shale quarries
- 150 m from the motorway
- 2,3 km from the closest point of the Balkhash Lake River, which is outside from the protection area around the Lake.
- 7 km from the railway station using the site railway connection that is part of the project.
- 7 km from the closest dwelling.

The proposed project works out to be economically viable, socially beneficial and environmentally friendly. The selected plant site allows an optimal operation of the quarries and the plant, an easy access to the transportation facilities with a sufficient distance from the village and to the Balkhash Lake river to minimize disturbances from the site.

6. Potential Impacts and mitigation measures

The Operation phase of the proposed cement plant mainly comprises of the following activities:

- Extraction of the raw materials (limestone, shale) from the quarries
- Transportation of the raw material from the quarries to the plant site
- Transportation of other correctives/additives to the plant site
- Preparation of raw meal by adding correctives to raw materials
- Clinkerisation of raw meal
- Cooling and heat recovery
- Blending and grinding of clinker by adding additives
- Packing and Dispatch.

The details of main activities and actions to be undertaken and their impacts during operation phase of plant and quarries are summarized below.

Sn	Component	Activities	Potential Impacts
1	Transportation of the raw materials and products	- Increase in traffic movement (road, railway) - Washing and maintenance of vehicles	- Contribution of dust and gaseous pollutants - Contribution to ambient noise level - Disposal of solid waste and waste water
2	Operation of plant/quarries	Quarries - Drilling - Blasting - Loading and Transportation - Operation of quarry machinery Plant - Crushing of limestone/other raw materials - Preparation of raw meal - Clinkerisation of raw meal - Cooling and heat recovery - Blending and grinding of clinker - Packing and Dispatch.	- Air emissions form operations Dust, NOx, SO2, GHG and unburned hydrocarbons. - Generating of noise and vibrations from blasting - Waste water generation from : o The plant o The camp - Solid waste from domestic usages, waste lubricating oil from machinery and waste water treatment plant, - Accidental spillage of oil, if any.
3	Socio-Economic	- Payment of taxes and royalty, - Direct and indirect employment, - Development of infrastructures as water supply, - Demand of local and agricultural products	- Employment to locals, - Business Opportunities to locals, - Increase in per capita income, - Change in living standard, - Regional Development.

Summary of Operational Phase Impacts and Proposed Mitigation Measures

AIR QUALITY			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Release of combustion gas emissions from the kiln stack	Primary operational management control techniques.	Local air quality will be well within the KZ limits and specified guidelines for the protection of human health at all relevant locations. On that basis, it is concluded that there will be no adverse health effects in the local population due to the operation of the cement plant.	Not significant
Release of particulate emissions from the kiln, the clinker cooler, the coal mill and the cement mill.	Bag filters and electro precipitator – dust abatement.	Local air quality will be within the EU limits and specified guidelines for the protection of human health.	Negligible
Release of dust emissions from the quarry operations.	Use of best practice management techniques during extraction and loading.	It is unlikely that there would be any discernable adverse effect due to dust deposition at any residential properties.	Negligible
Release of combustion emissions from transport associated with transport of materials to and from the site.	Use of new, efficient vehicles, driver training to minimize emissions (e.g. prevention of over revving, shut off engines when vehicles not in use), rationalization of traffic management system to optimize transport efficiency.	Localized minor effects on air quality at properties very close to certain roads, but increments a very small fraction of air quality criteria.	Negligible

SURFACE WATER AND GROUNDWATER			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Increase of sediment content in surface waters due to fugitive dust dispersion.	For cement plant: Storm water management through ditches and/or gutters and settlement ponds. For quarries: Quarrying face will be kept minimal. Gradual rehabilitation (through landscaping and planting) of the locations where extraction works have been completed. Storm water management through peripheral ditches and settlement pond.	None	Negligible
Degradation of surface waters quality due to process water direct disposal or leakage of polluting materials.	For cement plant: Process water circulation is closed circuit including settlement tank for treatment. Storage of fuels for cement production in enclosed storage area. Tidying the plant on regular basis with mechanical sweepers removing dust collected on the streets and gutters. Thorough washing of surfaces in case of polluting materials spillages and further processing of collected washings as special waste. For quarries: Appropriate collection and transportation of potential polluting materials (e.g. spent oils, lubricants, etc.)	None	Negligible

SURFACE WATER AND GROUNDWATER			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Pollution of surface water due to release of harmful/untreated sewage.	The sewage treatment system will be peak for peak demand during construction phase and therefore will cope with the demands during operational phase. No hazardous liquids will be released in to the sewage treatment system. The provision of a large balancing tank before final release will act as a storage unit in the event of accidental release into the sewage system.	None	Negligible
Soil Erosion	For cement plant: N/A For quarries: Gradual rehabilitation of locations where extraction works have been completed.	Soil erosion will be limited on-site the quarries.	Minor adverse
Ground and Groundwater contamination.	For cement plant and quarries: Secondary containment for potential polluting materials. Any contaminated land removal and disposal to appropriate hazardous waste sites.	Potential contamination will be limited on-site.	Minor adverse

LAND QUALITY			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Accidental release of fuels, oils, chemicals, hazardous materials, etc, to the ground during deliver to the site	Appropriate procedures and protocols to be established and monitored for materials delivery and handling	Potential for accidental release during delivery of materials to the site will be minimized	Minor adverse

Accidental release of fuels, oils, chemicals, liquid waste, hazardous materials, etc, to the ground during storage	All storage areas will have appropriate environmental security measures to prevent accidental release to ground	Potential for accidental release of materials during storage on the site will be minimized	Minor adverse
Accidental release of fuels, oils, chemicals, hazardous materials, etc, to the ground during transport to the area of use	Appropriate procedures and protocols to be established and monitored for materials transport and handling whilst on the site	Potential for accidental release of materials during transport within and handling on the site will be minimized	Minor adverse
Accidental release of fuels, oils, chemicals, hazardous materials, etc, to the ground, during use, for example, re-fuelling, maintenance, etc.	Appropriate procedures and protocols to be established and monitored for materials handling and use. Where possible, re-fuelling and maintenance areas will include some form of secondary containment	Potential for accidental release of materials during use will be minimized	Minor adverse
Accidental release of liquid wastes during removal from site	Appropriate procedures and protocols to be established and monitored for waste materials removal	Potential for accidental release of waste during removal from the site will be minimized	Minor adverse
Accidental discharge of sanitary wastewater and wastewater to ground	Sanitary wastewater will not be discharged to the ground Wastewater sumps and pits will be newly constructed. Pipework will be inspected periodically	None	Negligible/Nil
Discharge of pollutants in water used for plant, equipment and vehicle washing to ground	Washing activities will take place on areas with appropriate containment and procedures and protocols will be established and monitored to ensure that the preventative measures are efficient	Potential for accidental release of pollutants to the ground during washing activities will be minimized	Minor adverse

ENERGY AND GREENHOUSE GAS BALANCE			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Use of solid fuels and direct and indirect greenhouse gas emissions	Ensure that combustion and processing is as efficient as possible by appropriate maintenance activities.	Emissions of greenhouse gases	Moderate adverse

MATERIALS USE AND WASTE MANAGMENT			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Storage of solid and liquid wastes	Inspection of all waste storage areas to ensure appropriate segregation and containment	Potential releases into the environment.	Minor adverse
Waste management	Arrangement of all solid waste management licences and permits Establishment of waste management disposal/recycling techniques and appropriate choice of contractor Establishment of filter dust handling procedures and choice of the contractors Hazardous waste disposal techniques to be established Review of waste minimization and recycling options for all wastes	Waste management will be covered by internal procedures and will be regulated through local state regulations. Increased quantity of waste will be disposed of off site. Increase in recycling/reuse of waste generated	Minor adverse

ECOLOGY			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Disturbance of wildlife by noise	Reduce at source	There should be some habituation to lower reduced noise levels by some wildlife, but more sensitive species may avoid the project areas	Minor Adverse
Wildlife “Road-Kills” along access roads	Ecological Survey Ecological Method Statement Road Warning Signs Driver Briefings	With compliance, road-kills should be reduced but some are still inevitable	Minor Adverse

LANDSCAPE AND VISUAL			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Damage to the landscape character and visual amenity due to introduction of incongruous features and activities	Minimise the window between working and restoration phase of quarry	Some exposure to alteration of the landscape character and loss of visual amenity, predominantly due to off site activity	Minor to moderate adverse impact

TRAFFIC AND TRANSPORT			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Increased heavy vehicles local traffic	Avoid heavy truck movements in the night hours Implementation of special infrastructures to secure both plant and national traffic	There will not be a significant impact.	Minor Adverse

NOISE AND VIBRATION			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Noise from cement plant	None recommended unless the plant and various installations differ significantly from similar established plants used as a reference.	None expected	Nil
Noise from quarrying activities	Good site management; Appropriate choice of machinery; Methods of working; Hours of working; Efficient material handling.	There may be noise increases at residential properties in proximity to the quarry site boundary.	Minor Adverse
Noise from increases in traffic on the local road networks	None recommended on existing roads due to no predicted perceptible increases in noise levels due to the extra traffic	None expected on existing roads.	Nil

SOCIAL			
Environmental Impact	**Proposed Mitigation**	**Residual Impact**	**Residual Impact Rating**
Increased Employment (positive change)	Measures to maximise local employment and improve local skill base recommended.	This depends on skills of the young people and interest to return to home area, and on the opportunity offered by ANYS and targets set.	Major beneficial
Increased municipal tax and budget (positive change)	Assistance to villages to formulate projects and strengthen advocacy if requested by Liaison committee. Money from improved budget can be used to realize these objectives.	Increased municipal budget for Zhambyl district Residual impact will depend on effectiveness of allocation process in favor of affected villages. A poor process would cause conflict / discontent	Major beneficial

Electric and other infrastructure improvements (neutral or positive if realized)	None identified. This will be a "windfall" benefit (or benefit external to the project) if it occurs.	Potential impact on amenity through visual impact.	Neutral / Minor beneficial

Operational Environmental and Social Monitoring Plan

Items	Measures	Responsibility	Schedule
Emissions to air from main stack	Constant monitoring of the key parameters and spot sampling of secondary parameters. Monitoring equipment and methods shall be in accordance with KZ standards and specification guidelines.	ANYS INVEST	Throughout the operation of the plant from the commissioning of the plant.
	The daily averaged air emissions from the main stack shall not exceed the designed primary limits	ANYS INVEST	Throughout the operation of the plant from the commissioning of the plant.
Emissions from other parts of the installation	Dust Emissions from various parts of the plant shall not exceed 30 mg/Nm3 (except the cooler exhaust gas with 50 mg/Nm3)	ANYS INVEST	Throughout the operation of the plant from the commissioning of the plant.

Items	Measures	Responsibility	Schedule
Fugitive emissions to air	Constant vigilance and regular visual assessment of dust emissions.	ANYS INVEST	Throughout the operation of the plant from the commissioning of the plant.
Operational Noise – Health & Safety	Noise Monitoring program. Noise levels in operational areas of the plant should be measured and the risk of damage to hearing arising from high noise levels. Staff working in areas of high noise levels should undergo training and regular hearing checks.	ANYS INVEST	High Noise Levels areas should be identified when expected noise levels are available, and verified once the plant is operational. Staff training and hearing checks should be ongoing.
Protection of ground and groundwater	Fuels, chemicals, liquid wastes and potentially hazardous materials will be kept in designated storage areas. Refueling will be effected with a mobile bowser with suitable secondary containment and spill protection equipment. Plant maintenance and plant/vehicle washing will be carried out in dedicated areas with spill containment	ANYS INVEST	Secondary containment for all storage tanks and containers above 20-litres in total capacity (including loading areas) must be used. These must have impervious surfaces, free of voids; gaps, cracks and the material used must be compatible with the materials contained. The total bund capacity must be at least 110 % of the volume of the largest container or tank in the storage area. Proper maintenance of the secondary containment must be

Items	Measures	Responsibility	Schedule
			undertaken to keep debris, vegetation, leaked hazardous materials and storm water from accumulating; Roofs or covers should be constructed over transfer areas to minimize contact with surface water; All storage areas should be located in areas away from main construction activities and heavily trafficked routes; Areas must be kept dry and free of combustible materials; entrances, exits and aisles must be clear and unobstructed; Adequate lighting and ventilation must be provided. The areas must be secured from unauthorized access; All spills and leaks must be cleaned up promptly; Hazardous materials should be stored away from other storage areas. Suitable spill kits should be provided at all storage areas and at other suitable locations across the site. Workers should be trained in their use. All storage areas must be visually inspected at least monthly and the inspections recorded.

Items	Measures	Responsibility	Schedule
Landscape and Visual	Monitor soil erosion and establish a planting scheme, including advance planting with the aim to reduce erosion due to deforestation Monitor the establishment of on and off site planting with a permissible failure rate of with no more than 10% per year Manage access via the proposed access roads to reduce illegal stone mining Phase the quarry works and localized restoration to minimize the extent of exposed quarry face and window between extraction to restoration Monitor biodiversity enhancement through annual surveys	ANYS INVEST	To be agreed
Waste	For all waste streams (solid and liquid) data should be kept of: Waste quantities Physical form and containers used/packaging Disposal/treatment route Final disposal point Recycled/reused quantities All in house waste disposal/treatment facilities suitable monitoring/inspection in accordance with the relevant permit/license and legislation. Any breaches of legal requirements, including permits	ANYS INVEST	Monitoring data and a statement on compliance with this EMP shall be reported in the Annual Monitoring Report to Lenders.

Items	Measures	Responsibility	Schedule
	must be reported immediately.		
Waste waters	Regular inspection of drainage and all waste storage tanks (including domestic) will be included in the wastewater monitoring plan.	ANYS INVEST	Frequency and methods will be determined before the beginning of the work of the plant. Monitoring data and a statement on compliance with this EMP shall be reported on a timely defined manner.
Energy	Regular internal energy inspections on the plant; testing and tuning of burners, boilers etc and so on will be undertaken annually by competent experts to ensure that energy management is as efficient as possible. Undertake detailed study of the plant efficiency once the plant is operational to assess whether waste heat recovery for power generation or any other purpose is viable.	ANYS INVEST	Methods will be determined before the beginning of the work of the plant. Monitoring data and a statement on compliance with this EMP shall be reported on a timely defined manner.

6.2 Socio-Economic Development Plan

The proposed plant will actively contribute to improve the socio-economic conditions of the area. This project is the sole industrial project in the Mojynkum district, which today suffers of a low development level. The main aspects of the Socio-economic Development Plan are given below:

6.2.1 Community Development Fund

As an obligation driven from the mining license, Anys Invest is committed to finance with the authorities of the Mojynkum district an annual amount equivalent of 1% of the extraction costs which is estimated to 4 500 000 KZT per year for developing village facilities . The annual amount will be established in a fund. A committee comprising the representatives of the Mojynkum District, the Mynaral Village and Anys Invest will manage the fund.

6.2.2 Employment and Business Opportunity

During the operation phase of the plant, the project will create directly and indirectly more than 600 labors, a significant part coming from the village and the areas surrounding areas. Anys Invest will support its employees who will be ready to move with their families in the village by the construction of houses.

The Community Development Fund will also help the interested locals in setting up small businesses related to the plant activities (transport, car workshops, restaurants,).

As an obligation driven by the mining license, Anys Invest is also committed to spent an amount equivalent of 1% of the extraction costs which is estimated to 4 500 000 KZT per year for the training of its staff and the development of the education institutions of the Jambyl Province. For fulfilling this obligation, Anys Invest intends to develop partnerships with universities and technical schools in the project area.

6.2.4 Village facilities

A health center will be set up in the plant for its employees. The development of a medical dispensary will be supported by the Community Development Fund.

The village school has already benefited in 2008 to a donation of 3 600 000 KZT for refurbishment from Anys Invest. Anys Invest will continue to support the development of the village education facilities.

Anys Invest will help in improving the Village water supply. The water supply is currently done without treatment from the Balkash Lake and potable water is delivered by cisterns from the Shu railway station. The future water supply system will include a water treatment plant and a distribution network.

Anys Invest will support the improvement of the cleanness of the village.

6.3 Audits and Monitoring

Environmental monitoring and audits will be undertaken during & after the construction and development phase and during operation phase to check that the environmental management

measures are being satisfactorily implemented and that they are delivering the appropriate level of environmental performance. A summary of the proposed monitoring plan is given below.

Impact	Monitoring method	Parameters	Location	Frequency
Air quality	Measurement / sampling	PM/ PM10, NOx, SOx	Pyro-processing stacks	Continuous
		PM/ PM10	Cement grinding and clinker cooler stacks	Continuous
		PM/ PM10, Temperature, Oxygen level, CO	Combustion sources	Biannually
		Ambient PM/ PM10	Selected receptor villages, colony, plant premises	Quarterly
Noise	Measurement	Leq (dB(A))	Mines, Crusher, Raw mill, Cement Mill	Biannually
			Four (4) sites around Plant site	Every three years and upon complaints
Surface and ground water	Sampling	Temperature, pH, Oil content, Suspended solids, COD	Ground water wells, installed grease traps, oil/ water separators, sedimentation tanks	Annual
Soil	Sampling	Moisture content, pH, salinity, Nitrogen, Phosphate, Chloride, Potassium, Sodium	Agricultural plots near project site	Annual
		Heavy metal content (mercury, lead, chromium, copper, nickel, zinc and cadmium)		Every three years
Solid Waste	Audits, photographic documentation, and interviews	Generation, storage, recycling, transport and disposal	Plant premises	Annual
Biodiversity	Visual inspection and photographic documentation	General condition of the floral cover	Plant, mines and landscaped areas	Annual
Resource use	Metering	Water and energy consumption	Plant and mines	Continuously
	Audit	Raw material consumption	Plant and mines	Continuously

Health and Safety	Health and safety surveys	Proper use of PPE, presence of safety signs, first aid kit, fire fighting devices, Injury/ illness records. Accident statistics recording in accordance with ILO standards, including recording of Lost-Day- Accidents per Million-man- hours (LDA/MMH)	Plant,	Continuously
Socio-economic	Field questionnaire	Local population	Plant and surrounding areas	Annually
	Interviews	Employment records	Plant	Continuously
Operations monitoring	Visual inspection and documentation	Production rate, gas flow rates, counters readings, pressure valves, temperatures, abnormal readings, overloads, stoppages.	All facilities and major equipment at Plant and Mines	Daily

A Grievance Cell will also be established to address the complaints/ grievances of the local communities.

7. Public Consultation

In the frame of the preliminary ESIA preparation, public hearings were carried out and allowed revealing the relation of local population to the project works, to define the questions, concerning the project and its influence on environment.

The attitude of local population to the construction of cement plant was positive.

The basic problems, which the following should be solved for improvement of social conditions of residing in the project area, are the following:

- The maximum attraction of local population to the planned works;
- Inflow of means into the local budget for infrastructure development;
- Realization of strict control over technological activity, in order do not damage environment of the area;
- In case of an emergency, it has to be accepted the extraordinary measures on prompt liquidation of consequences and restoration of broken environmental conditions.

8. Resettlement Aspects

The project comprises of the following sections, which necessitate acquisition of land:

- Plant site

- Limestone and shale deposits (lease for 25 years)
- Quarry road
- Access from the motorway to the plant
- Railway connection
- High voltage line.
- Water line.

For any of these land plots, no resettlement was necessary. The acquired lands were previously a state property without any activities on them.

9. Conclusions

The proposed cement project will have a limited impact on the physical and natural environments of the Mynaral area. The area will nevertheless benefit positively on the socio economic sphere.

Air emissions from the plant will be highly controlled and the installation of state of art pollution equipment will limit the dust and gaseous pollutants levels much below the norms specified by the IFC to ensure a continued good air quality in the area.

The proposed plant and quarries will not affect the hydrology of the region, especially the Balkhash Lake. The impact on the fauna and flora existing in the area, which are commom species will be limited by the mitigation measures on the plant and quarries operations to be implemented.

Employment resulting from the plant and quarries operations and associated services and improved infrastructures and facilities in the area will be the main socio-economic benefits for the local community. The project will not cause resettlements.