Bi-annual Environmental Monitoring Report July to December 2012 and Final Project Report

Loan Number: 2503-Kaz
March 2013

Kazakhstan: International Transport Corridor CAREC 1 – Taraz-Korday in Zhambyl Oblast

Project Financing by Asian Development Bank and Government of Kazakhstan

C-002 Winter 2012 – 2013 Interchange Km 421

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Part I Introduction and Background

1. Background

1.1 Introduction

This report has been prepared by Senior Environmental Specialist Mr. Peter Hatton of SMEC International. It is the final report for the project and consists of the following elements:

Review of contractor monthly environmental monitoring and management reports for the period July to December 2012;

- Review of the contractor six-monthly reports for second half 2012;
- Review of rehabilitation activities undertaken by contractors following completion of construction activities;
- Project completion report

1.2 Project Scope

The project comprised a mix of rehabilitation of existing road and construction of new dual carriageway partly on existing alignment and partly on new alignment. Construction works were undertaken by three contractors as follows:

- Contract 001 – km 214 to km 260 – AKM
- Contract 002 – km 404 to 443 – Kazakhdostroy
- Contract 003 – km 443 to 483 - KCC

Details of each contract are provided in **Table 1.1** below.

Table 1.1 – Details of Contracts

Item	Measure	Scope of works
Contract - 001		
Road Length (km)	45.3	Rehabilitation of existing road by removal of old asphalt and replacement with fresh materials. Road is single carriageway in each direction and alignment generally follows the existing road. Work was implemented by using road diversions where practical and half width construction where diversions were not possible
Culverts (no.)	72	
Bridges (no.)	2	
Earthworks (Embankments) (m3)	404,290	
Sub-base (m3)	265,289	
Crushed stone base-course (m3)	109,254	
Lighting installation (Lm)	10,300	
Asphalt base-course (m3)	41,356	
Asphalt wearing course (m3)	27,706	

Table 1.1 (ctd)– Details of Contracts

Item	Measure	Scope of works
Contract - 002		
Road Length (km)	40.7	New dual carriageway in each direction with cement / concrete road pavement. Part of work on new alignments and part utilizing existing road pavement. New road constructed first and traffic then transferred from old road allowing for its upgrade
Culverts (no.)	57	
Bridges (no.)	4	
Earthworks (Embankments) (m3)	3,269,680	
Sub-base (m3)	602,960	
Base course (cement treated) (m3)	191,021	
Asphalt wearing course (m3)	7,200	
Lighting installation (Lm)	2,918	
Cement concrete base-course (13cm)	114,312	
Cement concrete wearing course (12 cm)	105,518	
Contract - 003		
Road Length (km)	40.4	Rehabilitation of existing road by removal of old asphalt and replacement with fresh materials. Road is single carriageway in each direction and alignment generally follows the existing road. Work was implemented by using road diversions where practical and half width construction where diversions were not possible
Culverts (no.)	31	
Bridges (no.)	3	
Earthworks (Embankments) (m3)	1,988,293	
Sub-base (m3)	648,412	
Base course (cement treated) (m3)	195,556	
Asphalt wearing course (m3)	252	
Lighting installation (Lm)	3711	
Cement concrete base-course (13cm)	105,898	
Cement concrete wearing course (12 cm)	97,556	

As at 31 December 2012 Contracts 002 and 003 were completed and 001 was complete except for minor works as shown below.

- Road marking with Thermoplastic of one edge line and road junctions;
- Gas pipe protection at Km 218
- Removal of branches of trees that are overhanging the road and road shoulder by cutting; and
- Completion of culvert protection works (4 culverts) and cleaning 20 culverts.

1.3 Environmental Management

The requirements for environmental management are detailed in Technical Specification 106 – Protection of the Environment. A copy of the specification is provided in Appendix A. The

specification provided the framework for environmental management for the construction phase of the project.

Key environmental issues addressed in the specification are summarised below.

A General

- Conformity with statutory and regulatory environmental requirements.
- Avoid creating environmental nuisance – control at source.
- Ensure removal of any deposited spoil, debris or silt that is deposited on adjacent land and restoration of the land to its original state to the satisfaction of the engineer.
- Prepare and implement an environmental mitigation and monitoring plan (CCEMMP) based on the technical specifications. Items to be addressed in the CCEMMP include:
  - Location of Construction Camps, Asphalt Plants, Cement Plants and Related Facilities.
  - Air Quality Monitoring.
  - Water Quality Monitoring
  - Noise & Vibration Monitoring.
  - Community Relations.

B Fuel and Chemical Storage

- Sited on impervious base within a bund secured by fencing and located away from watercourse or wetlands.
- Storage capacity 110% of volume of tanks within the bunded area.
- Adopt methods to ensure no contaminated discharges enter any drain or watercourse

C Water Quality

- Prevent any interference with the supply to or abstraction from or the pollution of water resources as a result of construction activities.
- Avoid discharge or deposit of waste materials any matter arising from construction activities into any waters except with the permission of the Engineer and the regulatory authorities concerned.
- Protect all watercourses, waterways, ditches, canals, drains, lakes from pollution, silting, flooding or erosion as a result of construction activities.
- Submit details of temporary drainage work system to the Engineer for approval prior to commencing construction work.

D Air Quality

- Open burning is prohibited.
- Utilise effective water sprays during the delivery and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather.
- Stockpiles of materials sited in sheltered areas or within hoarding, away from sensitive areas, friable material covered with clean tarpaulins, with application of sprayed water during dry and windy weather.

- Vehicles loaded with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards.
- Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition.
- In periods of high wind, dust generating operations not be permitted within 200 m of residential areas having regard to the prevailing direction of the wind.
- Construction vehicles and machinery shall be kept in good working order and engines turned off when not in use.
- In residential areas or other sensitive areas such as nurseries and hospitals etc., advance warning to potentially affected persons

E Noise

- To be considered as an environmental constraint in planning and construction
- Plant and equipment to conform to international standards and directives for noise and vibration emissions
- Ensure that the operation of all mechanical equipment and construction processes on and off the Site do not cause any unnecessary or excessive noise

F Earthworks

- Surplus excavation and topsoil to be used to reinstate borrow pits and quarries or other areas as may be approved by the Engineer. Materials to be spread so as to limit subsequent erosion and to be re-vegetated as existing ground cover dictates.

G Preservation of Antiquities

- Take all necessary measures to protect any antiquities or archaeological finds as required by the sub-point 4.24 of Conditions of Contract.
- Where antiquities are shown on the drawings or otherwise identified during the course of the Works, these shall be protected by means of suitable fencing and barriers to the satisfaction of the Engineer. Provide and maintain access at all times for persons wishing to stop and pay their respects.

H Environmental Enhancement

- All areas to be reinstated with natural vegetation on completion of construction.
- All old tyres and internal tubes to be removed from within the Limits of Site by the Contractor, and subject to the agreement of adjacent land owners, from an additional area 75m either side of the road centre line. All materials to be disposed of as approved by Engineer.
- Improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils, re-grading to natural ground levels, and re-establishing the natural vegetation where appropriate.

2. Changes in Project Organization and Environmental Management Team

2.1 Contract 001 - AKM

AKM continues to retain its site office and staff in Korday. The local environmental manager continues to perform his role under the contract. As noted in section 1.2 a number of minor works remain to be undertaken before the contract can be deemed completed.

2.2 Contract 002 - Kazakhdorstroy

The Engineer issued the Taking-Over Certificate on 7 November 2012 following inspection by the Working Commission and agreement that the work was completed.

Kazakhdorstroy closed the site office in Kulan on 7 December 2012. Most contractor staff, including local environmental specialists, were demobilized at that time.

2.3 Contract 003 - KCC

The engineer issued the Taking-Over Certificate for the works on 23 November 2012 following Working Commission inspection and agreement that the work was completed.

KCC has closed the site office at Uchbulak and staff, including the local environmental specialists have now been demobilized.

3. Relationships with Contractors, Owner, Lender and other stakeholders

Good relationships have been maintained with all relevant parties and stakeholders

Part II Environmental Monitoring

1. Environmental Monitoring Introduction

In accordance with requirements of Technical Specification 106 and each Environmental Mitigation and Monitoring Plan, monthly environmental monitoring and reporting to the Engineer has been undertaken by the three contractors. In addition, Kazakhdorstroy, AKM and KCC have submitted half yearly reports for the period July to December 2012.

The reports comprise the following elements:

- Introduction,
- Monthly reporting in accordance with table format provided by the Engineer,
- Monitoring results,
- Discussion of monitoring results, and
- Map showing location of monitoring sites.

Copies of the table format reports are provided in Appendix C

Contractors have established routine monitoring programs for noise and vibration, air quality, and water quality.

The reports show that contractors are undertaking construction activities within the constraints imposed by Kazakhstan legislation. No exceedences have been recorded.

2. Contractor Activities and Monitoring Results

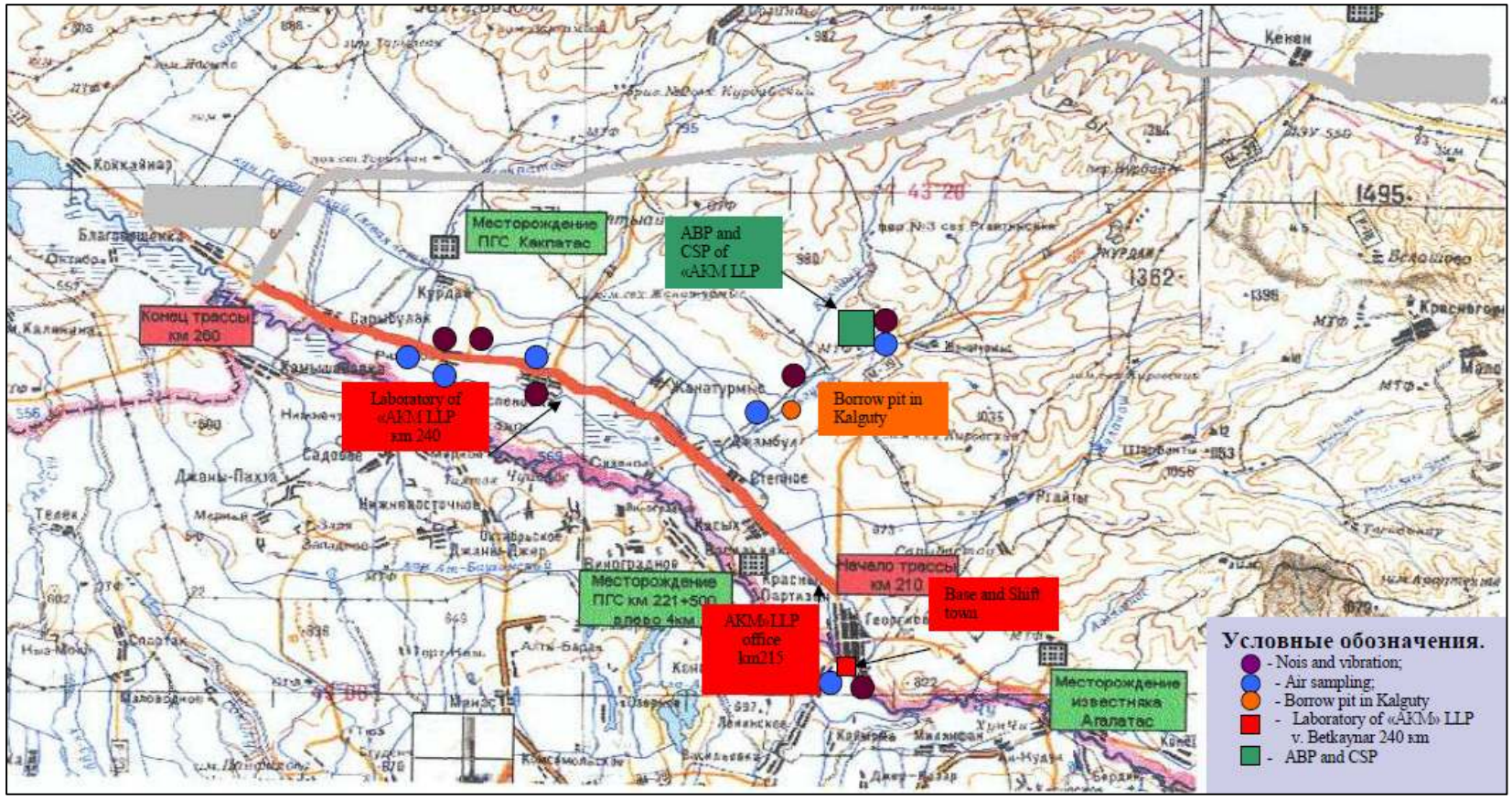
2.1 AKM

2.1.1 Introduction

In accordance with General conditions of the Contract item 4.18, and the Technical Specifications(TS) 106, AKM developed and implemented a Contractor Environmental Management and Monitoring Plan (CCEMMP).

The CEMMP provides the overall framework for Contractor implementation of TS106. Among other matters, it specifies contractor environmental monitoring requirements for the construction phase of the project.

The CEMMP was approved by the Engineer on May 2, 2010.



Location of AKM Environmental Monitoring Site

In accordance with CCEMMP requirements, AKM undertook the following activities during the second half of 2012:

- Conducted site training on environmental management for project personnel;
- Routinely undertook dust suppression measures on construction sites; approaches to the quarry and asphalt plant. The measures include the following:
  - Sprays from water tankers,
  - Canopy covers on material transport trucks,
- On the twentieth of every month the Contractor filed an application to the Municipal State Enterprise “Housing and communal services” for disposal and recycling of waste and transport and disposal of sewage (waste waters)
- From the 25th to the 30thof every month during the second half of 2012the AKM environmental specialist in company with the representatives of branch of Republican State Enterprise “Zhambyl Oblast Center of Sanitary and Epidemiological examination” visited work sites and conducted environmental monitoring of water and air quality and vibration and noise levels.
- In accordance with the approved rehabilitation plan for disturbed lands works on re-cultivation of 13 sites allocated for storage and inert materials, topsoil, groundwater reserves, temporary bypass roads with total length of 45 km from 210-260, a quarry of SGM deposit in Kalguty , according to the developed reclamation
- On the advice of an engineer, in the places of waste water storage, formed because operating Contractors campsite (see page 24).
- Also, it should be noted that for reporting month there were not identified any accidents, environmental breaches and factors leading to the environmental changes on the construction site.

2.1.2 Water Quality Monitoring

Water for construction and camp is extracted from a specialized well at Betkainar Village. Water from the well has been tested and confirmed as meeting drinking water standards.

Special septic tanks for storage of waste waters have been installed in the labor camps and Asphalt plant and Crushing plant. AKM signed an Agreement with Municipal State Enterprise for cleaning and emptying of the septic tanks and also removal of waste water to the treatment facilities. In accordance with the agreement, waste waters were transported several times a month.

In accordance with CEMMP requirements, AKM undertook routine water quality monitoring at specified locations on a monthly basis. AKM has a signed agreement with the Zhambyl Oblast Centre of Sanitary Epidemiological Expertise of the State Epidemiological Supervision Committee of the RK Ministry of Health to undertake the sampling and analyses.

There are only 2 open water courses and one canal in close proximity to construction site. They are the Kakpatas River at km 252, the Kalguty River at km 225+100 and an irrigation canal at km 219+440.Water samples were not taken from the Kakpatas River as works in this section had been completed. In addition, it was not possible to take water samples from the Kalguty River during much of the reporting period because of low water levels.

Results of the sampling show that there have been no recorded levels beyond maximum allowable concentrations (MAC) for the reporting period (See Appendix D)

2.1.3 Noise and Vibration Monitoring

AKM has a signed agreement with Zhambyl Oblast Centre of Sanitary Epidemiological Expertise of the State Epidemiological Supervision Committee of the RK Ministry of Health to undertake noise and vibration monitoring.

The monitoring was undertaken on a routine monthly basis and at agreed stages of construction at the following agreed locations:

- Vicinity of asphalt and crushing Plants, Almaty-Bishkek road km 185.3 km;
- Sand gravel quarry in Kalguty village located at road section 225+100, 3 km to the right 3 km;
- Road section km220+820, Kasyk village;
- Road section km221+800, (fill emplacement shoulders);
- Road section km 222+100 placement of bottom base course with C-4 material);
- Road section km 224+560 (construction of cattle crossing);
- Road section km 226+500 (placement of high-porous asphalt)
- Road section km 218+000 (placement of coarse-grained asphalt);
- Road section km 216+000 (placement of bottom base course with C-4 material)
- Road section km 215+600 (placement of sub-base)
- Road section km 214+600 (milling of roadbed)
- Road section km 227+000 (finishing of roadbed)
- Road section km 222+000 (placement of topsoil)

- Road section km 224+721 (construction of road junction)
- Road section km 228+800 (finishing of roadbed)
- Road section km 228+346 (construction of road junction)
- Road section km 215 (Kordai village - Contractor's and Engineer's offices)
- Road section km 240 (village Beitkainar, site office)

Results of the sampling show that there have been no exceedences beyond maximum allowable noise levels (MANL) for the reporting period (See Appendix E)

Noise and Vibration Monitoring on Contract 001

2.1.4 Air Quality Monitoring

AKM has an agreement with Zhambyl Oblast Centre of Sanitary Epidemiological Expertise of the State Epidemiological Supervision Committee of the RK Ministry of Health to undertake air quality monitoring.

The monitoring was undertaken on a routine monthly basis and at agreed stages of construction at the following agreed locations:

- Asphalt and Crushing Plants, Almaty-Bishkek road km 185, 3 km
- Sand gravel quarry in Kalguty village located at road section 225+100, 3 km to the right;
- Road section km220+820, Kasyk village
- Road section km221+800, (fill emplacement shoulders)
- Road section km 222+100 (placement of bottom base course with C-4 material)
- Road section km 224+560 (construction of cattle crossing)
- Road section km 226+500 (placement of high-porous asphalt)
- Road section km 218+000 (placement of coarse-grained asphalt)
- Road section km 216+000 (placement of bottom base course with C-4 material)
- Road section km 215+600 (placement of sub-base)
- Road section km 214+600 (milling of roadbed)
- Road section km 227+000 (finishing of roadbed)
- Road section km 222+000 (placement of topsoil)
- Road section km 224+721 (construction of adjunction)
- Road section km 228+800 (finishing of roadbed)
- Road section km 228+346 (construction of road junction adjunction)
- Road section km 215 (Kordai village Contractor's and Engineer's offices)
- Road section km 240 (Village Beitkainar, site office)

Results of the sampling show that there have been no exceedences beyond maximum allowable noise levels (MANL) for the reporting period (See Appendix C)

Air Quality Monitoring Kalguty Quarry

2.1.5 Issues from Monitoring Conducted in the Second Half of 2012

For the reporting period, there were no defined any issues of non-compliance arising from any construction activities conducted by AKM.

Some modifications to the reporting format were implemented following recommendations from the environmental audit in August 2011.

2.1.6 Public Relations

AKM held a series of information sessions for local communities to keep them informed about construction progress and upcoming activities.

Construction works are located in rural areas that have limited access to electronic media such as the internet. Local communities were informed at meetings with AKM staff and by local authorities (village akimats) who were briefed directly by AKM management. In addition, the contractor produced a series of posters, information stands and provided information to local media for distribution to local communities.

2.1.7 Tree Pruning

During March 2013 AKM undertook pruning of tree at KM 224 at the direction of the Engineer. The objective of the activity was to remove tree branches overhanging the carriageway and could present a safety threat to traffic along the highway below the overhangs.

AKM was directed to undertake the work in accordance with the tree pruning specification that was provided in May 2010. Specification 3.1 (b) states that "*all branches too large to support with one hand should be precut (see Figure 6) to avoid splitting or tearing of the bark. Where necessary, ropes or other equipment should be used to lower large branches or stubs to the ground*. "

AKM did not adopt this requirement of the specification. Accordingly, a number of the trees sustained damage as illustrated below.

Damage caused by poor pruning technique

2.1.8 Conclusions

The reports and inspections indicate that, with the exception of tree pruning, AKM has been implementing the requirements of the CCEMMP for contract 001.

No exceedences have been reported for noise and vibration, air quality and water quality standards. No non-compliances or corrective action requests have been issued during the reporting period.

2.2 Kazakhdorstroy

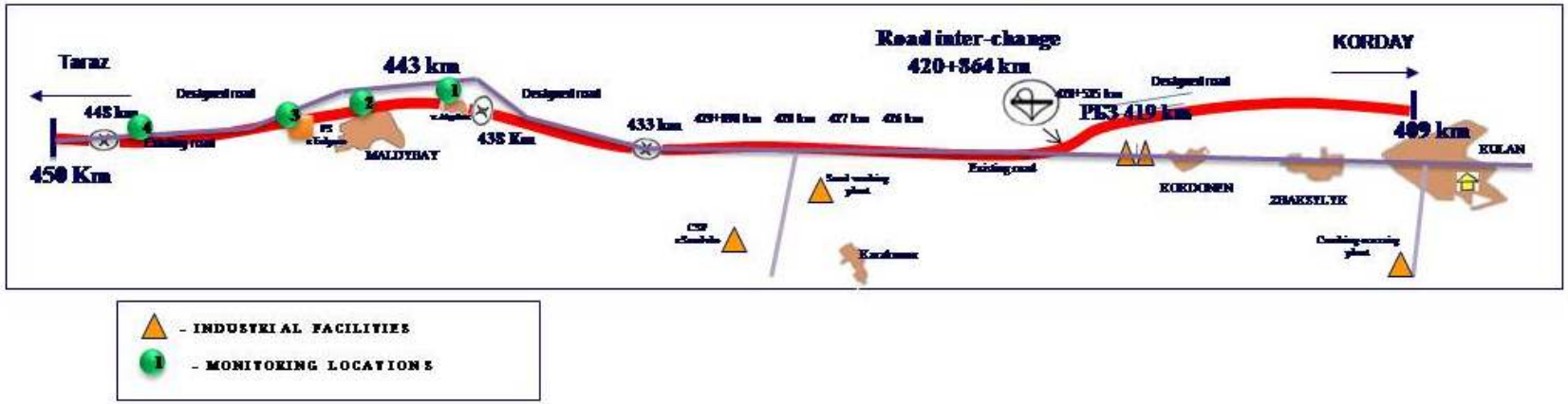
2.2.1 Introduction

In accordance with General conditions of the Contract item 4.18, and the Technical Specifications 106, Kazakhdorstroy has developed and implemented a Contractor Environmental Management and Monitoring Plan (CCEMMP). The CEMMP was approved by the Engineer on May 30, 2010. It includes details of the required environmental monitoring requirements under the contract.

Following an audit by the Senior Environmental Specialist a revised version of the CEMMP was prepared and approved by the Engineer on March 18, 2011. A further revision was approved by the Engineer in February 2012.

During the reporting period Kazakhdorstroy undertook the following environmental mitigation measures.

- Dust suppression of construction activities by water spray on disturbed surfaces;
- Covering materials with potential for dust generation by covering the loads with tarpaulins during transport;
- Informing residents adjacent to construction areas prior to commencement of activities;
- Undertaking minor vehicle repairs in designated areas providing protection from oil and fuel spills;
- Disposal of garbage and waste materials outside the construction site and transport to authorised landfill;
- Utilisation of stripped and stockpiled topsoil during rehabilitation of disturbed sites;
- Rehabilitation of the following areas in accordance with the approved plan;
    - Topsoil storage sites,
    - SGM quarry Kokdonen,
    - SGM quarry - Land Lot-1" and access road located at the boundaries of T. Ryskulov rayon and the Almaty to Taraz Highway (Road section km 404-443
    - Construction sites between Km 411 and Km 446 (see Rehabilitation Plan)



Schematic Location of Kazakhdorstroy Environmental Monitoring Site

2.2.2 Noise and Vibration Monitoring

Noise and vibration monitoring was undertaken at the following locations:

- Concrete batching plant (RBZ);
- Village Algabas;
- Village Maldybay;
- Service station Tulpar.

Results of the sampling show that there have been no exceedences beyond maximum allowable noise levels (MANL) for the reporting period (See Appendix D)

Noise and Vibration Monitoring – Village Albagas (above) and P.S. Tulpar (right)

2.2.3 Air Quality Monitoring

Air quality monitoring was undertaken at the windward and leeward monitoring points at the following locations:

- Concrete batching plant (RBZ);
- Construction site;
- Village Maldybay
- Village Albagas;
- Service station Tulpar

Results of the sampling show that there have been no exceedences beyond maximum allowable noise levels (MANL) for the reporting period (See Appendix C)

Air Quality Monitoring PS Tulpar

Air Quality Monitoring Albagas Village

2.2.4 Conclusions

The reports and inspections indicate that Kazakhdorstroy has undertaken construction activities in accordance with the requirements of TS106 and the approved CEMMP. No exceedences of maximum allowable limits for air quality or noise and vibration were recorded. No non-compliances or corrective action requests were issued during the reporting period

2.3 Contract 003 – KCC E & C / Zhambyl Zhol Kurylys JV

2.3.1 Introduction

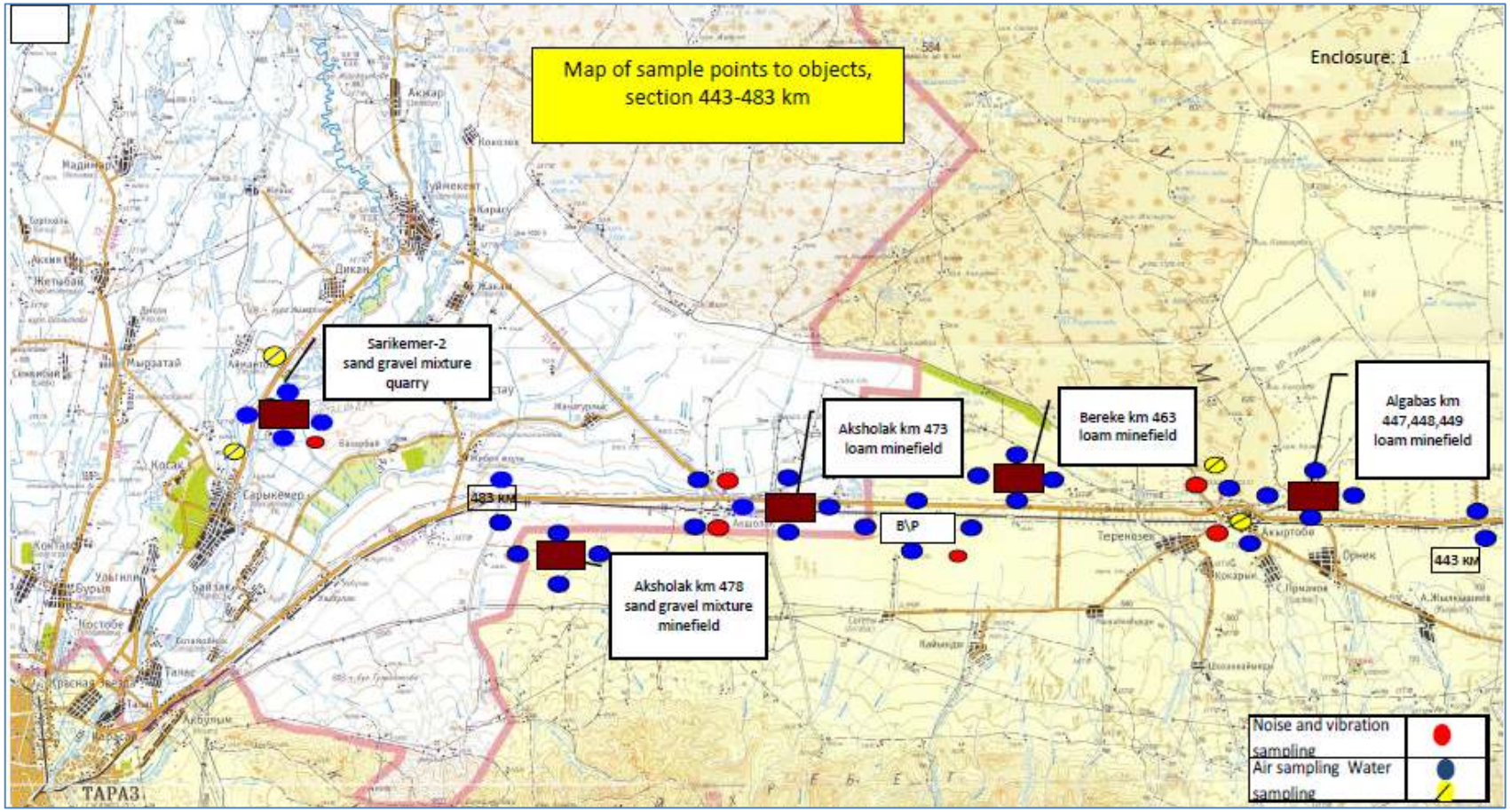
In accordance with General conditions of the Contract item 4.18, and the Technical Specifications 106, KCC developed and implemented a Contractor Environmental Management and Monitoring Plan (CCEMMP). The CEMMP was approved by the Engineer on July 19, 2010. It includes details of the required environmental monitoring requirements under the contract.

Following an audit by the Senior Environmental Specialist a revised version of the CEMMP was prepared and approved by the Engineer on February 8, 2011.

During the reporting period KCC undertook the following environmental mitigation measures.

- Dust suppression of construction activities by water spray on disturbed surfaces;
- Covering materials with potential for dust generation by covering the loads with tarpaulins during transport;
- Informing residents adjacent to construction areas prior to commencement of activities;
- Undertaking minor vehicle repairs in designated areas providing protection from oil and fuel spills;
- Disposal of garbage and waste materials outside the construction site and transport to authorised landfill;
- Utilisation of stripped and stockpiled topsoil during rehabilitation of disturbed sites;
- Rehabilitation of the following areas in accordance with the approved plan;
    - Sarykemer 1 Quarry
    - Aksholak 1 GSM Quarry
    - Aksholak 2 Loam quarry
    - Albagas 1, Albagas 2 and Albagas 3 Borrow pits

Map of locations of KCC environmental monitoring sites is shown over page.



Location of KCC Environmental Monitoring Sites

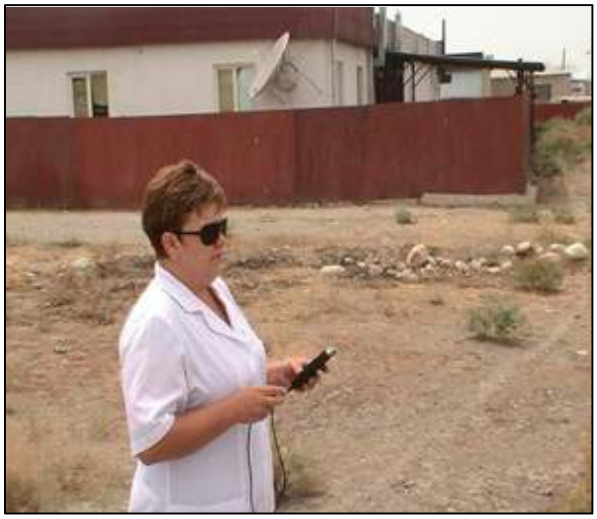
2.3.2 Noise and Vibration Monitoring

During the reporting period noise and vibration was undertaken at the following locations:

- Village Aksholak – 2 locations
- Village Akyrtobe – 2 locations
- Concrete batching plant
- Sarykemer quarry.

Monitoring in the villages was undertaken from July to October (inclusive). From November onward monitoring was suspended because construction activities were completed. Monitoring at the batching plant and Sarykemer was suspended in September because they were no longer operational.

No exceedences were recorded at any of the monitoring locations.



Noise and Vibration Monitoring

- **Aksholak Village (above)**
- **Concrete BP (top right)**
- **Sarykemer Quarry (right)**

2.3.3 Air Quality Monitoring

During the reporting period ar quality monitoring was undertaken at the following locations

- Construction site km 483 (2 sites) – July to October;
- Construction site km 443 (2 site) – July to October
- Aksholak Loam Quarry (2 sites) – July
- Aksholak GSM Quarry (2 sites) - July, September, October
- Albagas No 3 Borrow Pit (2 sites) – August
- CBP (2 sites) – July to September
- Sarykemer Quarry (2 sites) – July to September.

No exceedences were reported

Air Quality Monitoring Contract 003

- **Akyrtobe Village (top left)**
- **Albagas Village (top right)**
- **Concrete batching plant (left)**

2.3.4 Water Quality Monitoring

During the reporting period water quality monitoring was undertaken at the following locations:

- Project Office Uchbulak (2 sites) – July to October;
- Concrete batching plant, Aksholak (2 sites) – July, August;
- Talas River (4 sites) - ;
- Water course Akyrtobe (2 sites)

No exceedences were reported.

KCC Water Quality Sampling

- **Akyrtobe Village (Top Left)**
- **Talas River at Sarykemer Quarry (above right)**
- **Talas River downstream from Sarykemer Quarry (Left)**

3. Quarry and Borrow Pit Rehabilitation

3.1 Introduction

The Technical Specifications include a number of requirements relating to rehabilitation of disturbed areas.

Specification 512 includes the following:

"Borrow areas shall be excavated to regular widths and shape and shall be cleaned up and reinstated on completion having regard to the requirements of Section 100 of this Specification. Side slopes of reinstated borrow areas shall have a maximum slope of 6 horizontal to 1 vertical and the final shape shall be blended to the surrounding contours to ensure that water drains away naturally without causing damage to surrounding areas"

Specification 106 (H) requires the following:

"On completion of the Works the Contractor shall reinstate all areas with natural vegetation to the satisfaction of the Engineer.

The Contractor shall remove all old tyres and internal tubes from within the Limits of Site, and subject to the agreement of adjacent land owners, from an additional area 75m either side of the road centre line. The Contractor shall dispose of all materials in a manner approved by the Engineer.

Where directed by the Engineer, the Contractor shall improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils, re-grading to natural ground levels, and re-establishing the natural vegetation where appropriate. All debris and contaminated materials shall be disposed off-site as approved by the Engineer."

All three contractors have had Rehabilitation Plans approved by the Engineer in accordance with TS 106(H).

In addition to the Technical Specifications, there are Zhambyl Oblast Ecology Department requirements relating to the management and rehabilitation of borrow pits and quarries. For example the Oblast permit for AKM to rehabilitate the Kalguty quarry includes the following requirements:

- Emitted air pollution not to exceed 2,958 tonnes;
- Release of contaminants not to exceed 6,082 tonnes

3.2 Contract 001 - AKM

An extract from the approved Rehabilitation is shown below.

AKM Approved Rehabilitation Plan

No	Name of Measures	Normative Materials
1	Strengthening and construction of areas and locations affected by the project works	Working project of "Reconstruction of a 210-260 km of road Almaty – Korday - Blagoveshchenka – Merke – Tashkent – Termez" under road category 2
2	Filling of the topsoil on slopes of the embankments	
3	Strengthening of road junctions in places affected by the project	
4	Rehabilitation of 13 sites used for stockpile of materials, aggregates, top soil, loam soil, in accordance with the approved rehabilitation plan.	Rehabilitation of disturbed lands utilised by AKM LLP during the project as temporary by-pass roadsand storage areas for inert, milled material and top soil for the construction of the road.
5	Rehabilitation of temporary bypass roads totaling 12 km from 210 -260 according to the rehabilitation plan. Balance of bypass roads to remain in service at request of the local Akimat	
6	Rehabilitation of SGM quarry Kalguty, according to the rehabilitation plan	Rehabilitation of of SGM Kalguty in the Korday district of Zhambyl region

See Appendix B for photographs

3.3 Contract 002 – Kazakhdorstroy

Kazakhdorstroy approved Rehabilitation Plan is summarised below

No	Target Purpose	Location (km)	Area (ha)	Required extent of Rehabilitation			Comment
				Cleaning	Leveling	TSL Leveling	
1	Storing of TSL	411	1.21	100	100	100	Completed
2	Storing of RBM	411	2.05	100	100	100	Completed
3	Storing of TSL	414	1.22	100	100	100	Completed
4	Storing of TSL	417	1.24	100	100	100	Completed
5	Storing of RBM	418	2.12	100	100	100	Completed
6	Storing of RBM	418	4.14	100	100	100	Completed
7	Storing of RBM	420	3.05	100	100	100	Completed
8	Siting of CBP & GBP	418	5.93	100	100	100	Continuing use for Tranche 3 (Kulan Bypass)
9	Storing of TSL	421	1.22	100	100	100	Completed
10	Storing of TSL	426	1.27	100	100	100	Completed
11	Storing of RBM	428	2.01	100	100	100	Completed
12	Storing of TSL	429	1.21	100	100	100	Completed
13	Sand washing unit	430	4.41	100	100	100	Continuing use for Tranche 3 (Kulan Bypass)
14	Storing of TSL	431	1.23	100	100	100	Complete
15	Storing of TSL	434	1.11	100	100	100	Complete
16	Storing of RBM	438	3.02	100	100	100	Complete
17	Storing of RBM	439	3.09	100	100	100	Complete
18	Storing of TSL	438	1.24	100	100	100	Transferred to previous occupier for cropping
19	Storing of TSL	441	1.29	100	100	100	
20	Storing of TSL	445	1.30	100	100	100	Completed
21	Storing of RBM	446	2.01	100	100	100	Completed
22	Storing of TSL	446	1.25	100	100	100	Completed
23	SGM Quarry	Kokdonen	36.53	100	100	100	Completed
Total Area (ha)			**83.15**				

See Appendix B for photographs

3.4 Contract 003 – KCC

KCCSummary Approved Rehabilitation Plan

Quarry	Index	Unit	Quantity
Aksholak SGM	Area of quarry	Ha	19.0
	Area of disturbed land for rehabilitation	Ha	19.0
	Area to be rehabilitated	Ha	19.0
	Area for revegetation	Ha	19.0
	Volume of top soil removed	M3	44160
	Area of top soil stockpile	M2	3600
	Volume of earthworks for backfilling deep parts of quarry	M3	63689.2
Aksholak Loam	Area of quarry	Ha	8.3
	Area of disturbed land for rehabilitation	Ha	8.3
	Area to be rehabilitated	Ha	8.3
	Area for revegetation	Ha	8.3
	Volume of top soil removed	M3	21600
	Area of top soil stockpile	M2	1920
	Volume of earthworks for backfilling deep parts of quarry	M3	32550
Albagas Loam Quarries 1, 2 and 3	Area of quarries	Ha	16.79
	Area of disturbed land for rehabilitation	Ha	16.79
	Area to be rehabilitated	Ha	16.79
	Area for revegetation	Ha	16.79
	Volume of top soil removed	M3	33580
	Area of top soil stockpile	M2	1.39
	Volume of earthworks for backfilling deep parts of quarry	M3	133649
Bereke Loam Quarry	Area of quarry	Ha	12.3
	Area of disturbed land for rehabilitation	Ha	12.3
	Area to be rehabilitated	Ha	12.3
	Area for revegetation	Ha	12.3
	Volume of top soil removed	M3	49200
	Area of top soil stockpile	M2	1.75
	Volume of earthworks for backfilling deep parts of quarry	M3	123,385

It should be noted that Bereke Quarry rehabilitation has not yet commenced because, with Engineer approval, it has been retained for further projects. Rehabilitation obligation remains.

KCC Summary Approved Rehabilitation Plan (ctd)

Quarry	Index	Unit	Quantity
Sarykemer-2 SGM	Area of quarry	Ha	8.0
	Area of disturbed land for rehabilitation	Ha	8.0
	Area to be rehabilitated	Ha	8.0
	Area for revegetation	Ha	8.0
	Volume of top soil removed	M3	16000
	Area of top soil stockpile	M2	8236
	Volume of earthworks for backfilling deep parts of quarry	M3	31840

See Appendix B for photographs

Part III Overall Project Report

1. Introduction

This section summarizes the overall environmental performance of the three construction contractors during the construction phase of the project and recommends measures to achieve improved outcomes in future projects.

All contractors had no prior experience constructing a road project within the parameters required by ADB Safeguards Policy. Not surprisingly, there were some initial problems and misunderstandings about implementation of ADB requirements. However, after initial hesitancy, all contractors performed to a satisfactory level.

All contractors appointed local environmental specialists to their workforces. The local specialists were the main point of contact for the Construction Supervision Consultant (SMEC International)and the Senior Environmental Specialist in relation to environmental management issues. The CSC resources were supplemented by the appointment of a local environmental specialist to the CSC team in Q3, 2012.

The Senior Environmental visited each contract twice each year for three to four weeks to review the previous six month's performance and recommend any required modifications to contractor activities, monitoring procedures and reporting. A mid-project environmental audit was also conducted in August 2011.

2. Technical Specification (TS) 106

As noted earlier in this report the primary contractual requirements for contractor environmental management are encapsulated in TS 106. A full extract of the TS 106 is provided in Appendix 1.

In order to assist the contractors satisfy the requirements of TS 106, the Senior Environmental Specialist developed the following documents:

- Guidelines for preparation of the Contractor EMMP;
- Checklist to determine acceptability of CEMMP. This document was developed for use by the Contractor, Engineer, Project Management Consultant (PMC), MoTC and ADB;
- Format for monthly environmental management and monitoring plan report;
- Specification for Tree Pruning (Contract 001).

During the visit of March / April 2010, a number of meetings were held with contractor environmental staff to guide them through the various processes.

All three contractors utilised these guidelines to prepare the Contractor EMMPs that were acceptable to the Engineer and for the required monthly reporting.

After the initial uncertainty all three contractors were able to demonstrate a high level of compliance with TS106. Contractor performance is summarised in the following table.

TS 106 Requirement	Contractor Implementation		
	AKM- 001	**Kazakhdorstroy - 002**	**KCC - 003**
Prepare CEMMP to satisfaction of Engineer	Yes – Rev1 approved 2/6/10	Yes – Rev1 approved May 30, 2010. Rev2 approved March 18, 2011	Yes – Rev1 approved 19/7/10 Rev2 approved 8/2/2011
Environmental Office appointed	Yes – Eldos Mendekeev on 18/7/2010	Yes – Y.A. Potapenko	Yes – 1 July 2010
Siting of facilities planned and sited to satisfaction of Engineer	Yes – agreed by Authorised Agencies 1/12/2011	Yes – undertaken in accordance with Engineer approval 14/2/11	Yes – Undertaken in accordance with Engineer approval
Pre-construction AQ monitoring as required by Engineer	Yes – AQ baseline monitoring at approved sites	Yes – AQ baseline monitoring in accordance with Engineer approval	Yes – AQ baseline monitoring at approved sites
Pre-construction TSP monitoring at no less than 2 sites	Yes – Sites identified in monthly monitoring report	Yes – Sites identified in monthly monitoring report	Yes – Sites identified in monthly monitoring report
Monitoring undertaken by third party organisation acceptable to the Engineer	Yes – Testing laboratory - KZ.P.08.07.60 Zhambyl affiliate of JSC NaTsEkS 0n 28/4/2010	Yes – Undertaken by KESO Otan LLP – Accreditation Certificate KZ.1.08.1065	Yes – Undertaken by KESO Otan LLP – Accreditation Certificate KZ.1.08.1065
Pre-construction water quality monitoring as required by Engineer	Yes – Water quality baseline monitoring at approved sites	Not required – no surface or groundwater in project area	Yes – Water quality baseline monitoring at approved sites
Monitoring includes TSS, BOD, DO, conductivity, faecal coliform, oil & grease	Yes	Not required – see above	Yes
Pre-construction baseline monitoring of noise and vibration at mi8nimum 2 sites including major settlements	Yes - Baseline noise monitoring undertaken as required	Yes - Baseline noise monitoring undertaken as required	Yes - Baseline noise monitoring undertaken as required
Community relations requirements	Yes - Public provided prior information by mass media, internet, community meetings and village Akims	Yes - Public provided prior information by mass media, internet, community meetings and village Akims. Notices placed in local papers	Yes - Fuel and chemicals not stored on site. Vehicles refueled at approved
Fuel and chemical storage sited on impervious base within a bund secured by fencing	Yes - Fuel and chemicals not stored on site. Vehicles refueled at approved refueling stations	Yes - Fuel and chemicals not stored on site. Vehicles refueled at approved refueling stations	Yes - Fuel and chemicals not stored on site. Vehicles refueled at approved refueling stations
Contractor shall prevent any interference with supply or abstraction from supply or pollution of water resources including ground water	Yes - Project included repairs to bridges on the rivers Kakpatas and Kalguty and GM irrigation canal. Measures were undertaken to prevent any pollution from construction activities	Not applicable – no ground or surface water resources within the project area	Yes – Contractor provided mitigation measures for the Talas River at Sarykemer Quarry and water course near Akyrtobe village
Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept free from any debris and materials arising from the Works	Yes - Project included repairs to bridges on the rivers Kakpatas and Kalguty and GM irrigation canal. Measures were undertaken to prevent any pollution from construction activities	Not applicable – no ground or surface water resources within the project area	Yes – Contractor provided mitigation measures for the Talas River at Sarykemer Quarry and water course near Akyrtobe village

TS 106 Requirement	Contractor Implementation		
	AKM- 001	**Kazakhdorstroy - 002**	**KCC - 003**
Contractor shall utilise effective water sprays during delivery and handling of materials when dust likely to be created and to dampen stored materials during dry and windy weather	Yes – Water sprays utilised as required	Yes – Water sprays utilised as required	Yes – Water sprays utilised as required
Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards	Yes - All loading vehicles were provided with properly fitting side andtail boards.	Yes - All loading vehicles were provided with properly fitting side andtail boards.	Yes - All loading vehicles were provided with properly fitting side andtail boards.
Appropriate measures shall be taken to limit exhaust emissions from construction vehicles emissions from construction vehicles, machinery & plant & contractor shall include details in EMMP	Yes – AKM acquired new machinery and vehicles for the project. All complied with Euro 3 emission standards and were maintained by qualified sub-contractor in accordance with manufactures' specifications	Yes – New machinery and vehicles were acquired for the project. All complied with Euro 3 emission standards and were maintained by qualified sub-contractor in accordance with manufactures' specifications	Yes – New machinery and vehicles were acquired for the project. All complied with Euro 3 emission standards and were maintained by qualified sub-contractor in accordance with manufactures' specifications
Contractor shall use plant and equipment conforming to international standards and directives on noise and vibration emissions	Yes - The Crushing Plant (located at "MBT" LLP quarry) conforms to International standards (Euro 3).	Yes - Crusher plant (located in Sulu-Tor quarry), concrete batching plant, sand-gravel plant, CSP "Sandvik" met requirements of international standards (Euro 3).	Yes – New machinery and vehicles were acquired for the project. All complied with Euro 3 emission standards and were maintained by qualified sub-contractor in accordance with manufactures' specifications
Surplus excavation and topsoil shall wherever possible be used to reinstate borrow pits and quarries or other areas as may be approved by the Engineer	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report. Included respreading stored top soil	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report. Included respreading stored top soil	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report. Included respreading stored top soil
On completion of the Works the Contractor shall reinstate all areas with natural vegetation to the satisfaction of the Engineer	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report
When directed by the Engineer, the Contractor shall improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils regrading to natural ground levels, and re-establishing the natural vegetation	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report. Included removal of all debris, regrading to natural ground levels and reestablishing natural vegetation.	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report. Included removal of all debris, regrading to natural ground levels and reestablishing natural vegetation	Yes – Rehabilitation Plan approved by the Engineer and implemented as shown in Part II section 3 of this report. Included removal of all debris, regrading to natural ground levels and reestablishing natural vegetation

3. Potential Lead Contamination of Roadsides.

Because of widespread use of leaded fuels by Kazakhstan vehicles, the project environmental impact assessment (PEIA) suggested that the project roadsides within 10 metres of the carriageway could be contaminated by lead to a concentration 27 times the maximum permissible level for human exposure.

It should be noted that this conclusion was based entirely on modelling. There was no field testing during the PEIA development to confirm the model findings.

As recommended in the Initial Environmental Examination (IEE), the CSC arranged for sampling and testing of roadside soils to determine the extent of actual lead contamination.

The soil samples were collected by the contractors according to the following specifications:

- Samples at I km intervals on both sides of the existing highway;
- Sample size 1 to 2 kg per sample;
- Samples taken from a depth of 120 to 150 mms;
- Samples taken 1 metre for the carriageway;

152 samples were collected using this methodology and sent to a testing facility in Almaty. Samples were sent to a testing facility in Almaty for analysis.

Results of the sampling and testing program are shown below. It should be noted that only 2 of the tested 152 samples were assessed with lead concentrations of the maximum allowable concentration (MAC) of 32 mg/kg.

The two locations with excessive lead concentrations were retested in October 2011. The results from the retesting showed concentrations with the permitted MAC.

In the tables below sites shown as a are on the left side of road facing Taraz and sites shown as b are on the right side. For contract 002 samples were taken from either side alternately.

Lead Testing Results Contract 001 – May 2010

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
1	245a	14	32.0	-18
2	245b	18	32.0	-14
3	246a	40 / **26 (10/11 retest)**	32.0	**+8 (Exceedence)**
4	246b	14	32.0	-18
5	247a	12	32.0	-20
6	247b	16	32.0	-14
7	248a	18	32.0	-14
8	248b	14	32.0	-18

Lead Testing Results Contract 001 – May 2010 (ctd)

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
9	249a	18	32.0	-14
10	249b	68 / **24(10/11 retest)**	32.0	**+36 (Exceedence)**
11	250a	26	32.0	-6
12	250b	24	32.0	-8
13	251a	12	32.0	-20
14	251b	10	32.0	-22
15	252a	16	32.0	-16
16	252b	12	32.0	-20
17	2523a	16	32.0	-16
18	253b	14	32.0	-18
19	254a	12	32.0	-20
20	254b	16	32.0	-16
21	255a	14	32.0	-18
22	255b	18	32.0	-14
23	256a	20	32.0	-12
24	256b	24	32.0	-8
25	257a	16	32.0	-16
26	257b	12	32.0	-20
27	258a	16	32.0	-16
28	258b	14	32.0	-18
29	259a	16	32.0	-16
30	259b	18	32.0	-14
	Total	**558**	**Mean**	**18.6**

Sites 3 and 10 were retested in October 2011. Retested results are shown in **bold.**

Lead Testing Results Contract 002 – May 2010

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
1	404	15.5.	32.0	-16.5
2	405	13.9	32.0	-18.1
3	406	0	32.0	-32.0
4	407	18.0	32.0	-14.0
5	408	14.9	32.0	-17.1
6	409	13.7	32.0	-18.3
7	410	10.2	32.0	-21.8
8	411	14.5	32.0	-17.5

Lead Testing Results Contract 002 – May 2010 (ctd)

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
9	412	17.2	32.0	-14.8
10	413	12.6	32.0	-19.4
11	414	10.6	32.0	-21.4
12	415	16.3	32.0	-15.7
13	416	18.7	32.0	-13.3
14	417	12.5	32.0	-19.5
15	418	11.9	32.0	-20.1
16	419	24.0	32.0	-8.0
17	420	14.6	32.0	-17.4
18	421	13.3	32.0	-18.7
19	422	17.3	32.0	-14.7
20	423	17.5	32.0	-14.5
21	424	13.0	32.0	-19.0
22	425	0	32.0	-32.0
23	425	17.9	32.0	-14.1
24	427	5.6	32.0	-26.5
25	428	17.5	32.0	-14.5
26	429	8.25	32.0	-23.75
27	430	16.3	32.0	-15.7
28	431	15.2	32.0	-16.8
29	432	8.1	32.0	-23.9
30	433	15.2	32.0	-16.8
31	434	19.6	32.0	-12.4
32	435	14.7	32.0	-17.3
33	436	13.5	32.0	-18.5
34	437	23.1	32.0	-8.9
35	438	9.5	32.0	-22.5
36	439	12.2	32.0	-19.8
37	440	13.5	32.0	-18.5
38	441	9.8	32.0	-22.2
39	442	16.9	32.0	-15.1
40	443	9.9	32.0	-22.1
	Total	**546.95**	**Mean**	**-13.7**

Lead Testing Results Contract 003 – May 2010

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
1	443a	25.5.	32.0	-6.5
2	443b	20.8	32.0	-11.2
3	444a	24.5	32.0	-7.5
4	444b	18.3	32.0	-13.7
5	445a	0	32.0	-32.0
6	445b	10.3	32.0	-21.7
7	446a	14.6	32.0	-17.4
8	446b	17.2	32.0	-14.8
9	447a	5.25	32.0	-26.75
10	447b	11.8	32.0	-20.2
11	448a	12.4	32.0	-19.6
12	448b	9.7	32.0	-22.3
13	449a	12.08	32.0	-19.9
14	449b	8.3	32.0	-23.7
15	450a	10.0	32.0	-22.0
16	450b	13.6	32.0	-18.4
17	451a	11.25	32.0	-20.8
18	451b	10.8	32.0	-21.2
19	452a	12.7	32.0	-19.3
20	452b	19.1	32.0	-12.9
21	453a	18.8	32.0	-13.2
22	453b	17.0	32.0	-15.0
23	454a	21.1	32.0	-10.9
24	454b	14.8	32.0	-17.2
25	455a	10.8	32.0	-21.2
26	455b	12.4	32.0	-19.6
27	456a	9.9	32.0	-22.1
28	456b	7.1	32.0	-24.9
29	457a	16.1	32.0	-15.9
30	457b	15.2	32.0	-16.8
31	458a	12.7	32.0	-19.3
32	458b	10.0	32.0	-22.0
33	459a	12.8	32.0	-19.2
34	459b	10.2	32.0	-21.8
35	460a	11.1	32.0	-20.9
36	460b	15.3	32.0	-16.7
37	461a	7.4	32.0	-24.6
38	461b	15.3	32.0	-16.7

Lead Testing Results Contract 003 – May 2010 (ctd)

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
39	462a	17.8	32.0	-14.2
40	462b	13.8	32.0	-18.2
41	463a	7.0	32.0	-25.0
42	463b	9.2	32.0	-22.8
43	464a	12.4	32.0	-19.6
44	464b	12.4	32.0	-19.6
45	465a	8.5	32.0	-23.5
46	465b	11.3	32.0	-20.7
47	466a	15.5	32.0	-16.5
48	466b	20.4	32.0	-11.6
49	467a	13.5	32.0	-18.5
50	467b	16.2	32.0	-15.8
51	468a	18.5	32.0	-13.5
52	468b	20.1	32.0	-11.9
53	469a	21.3	32.0	-10.7
54	469b	11.0	32.0	-21.0
55	470a	14.9	32.0	-17.1
56	470b	18.0	32.0	-14.0
57	471a	15.7	32.0	-16.3
58	471b	17.3	32.0	-14.7
59	472a	13.5	32.0	-18.5
60	472b	15.1	32.0	-16.9
61	473a	13.4	32.0	-18.6
62	473b	16.2	32.0	-15.8
63	474a	2.58	32.0	-29.4
64	474b	5.61	32.0	-26.4
65	475a	20.5	32.0	-11.5
66	475b	0	32.0	-32.0
67	476a	17.9	32.0	-14.1
68	476b	13.2	32.0	-18.8
69	477a	3.3	32.0	-28.7
70	477b	7.4	32.0	-24.6
71	478a	13.5	32.0	-18.5
72	478b	16.2	32.0	-15.8
73	479a	16.5	32.0	-15.5
74	479b	15.3	32.0	-16.7
75	480a	0	32.0	-32.0
76	480b	5.1	32.0	-26.9

Lead Testing Results Contract 003 – May 2010 (ctd)

Site No	Sampling Location (Road Shoulder) (km)	Result (mg/kg)	MAC (mg/kg)	Variation
77	481a	14.4	32.0	-17.6
78	481b	17.2	32.0	-14.8
79	482a	4.5	32.0	-27.6
80	482b	7.0	32.0	-25.0
81	483a	8.75	32.0	-23.3
82	483b	11.61	32.0	-20.4
	Total	**1045.93**	**Mean**	**-12.9**

Following receipt of the test results it was concluded that there was no requirement for development of particular lead handling specifications

4. Interaction with NGO – Taraz Press Club

A number of complaints were lodged by NGO Taraz Press Club about the environmental and social performance of the Contractors. The Engineer provided responses to those complaints that were relevant to Tranche 1. The relevant complaints and responses are summarised below.

Summary of Complaints by NGO Taraz Press Club and Responses by Engineer

Complaint	Engineer Response
Subsurface Resources Borrow Pit in water protection Zone of Kakpatas River: 200m downstream of Bridge.	The borrow pit is privately owned. The Engineer banned the Contractor from using this pit as a supply source in early 2010. This situation has not changed. The Contractor has not used this pit as it is in the "water zone". The pit is not owned by the Contractor.
Loam borrow pits is located on the right side of the road in 70 meters opposite of exit road from Ornek village. These are the farm lands with trees shelter-belts. Square of loam extraction at depth of 3 meters is 10 hectare	This is the Algabas Pit. The Contractor has license for the extraction of soils for area of 42ha and he has excavated 16.79 ha. Reference 09-1326 of 23rd December 2010. **Note** - The pit has now been rehabilitated by KCC in accordance with approved Rehabilitation Plan (See Appendix B of this report).
Loam and fine gravel borrow pit is located on 480+0 km in 2 km. from Aksholak village. Borrow pits square including berms used for stockpiling is approximately 7.5 hectare (250*300). It is located in 100 meters to the left from the road on the farm lands. Rubbish and solid wastes are stockpiled here.	This area is approved for 9ha. Contractor has worked 6.74 ha. Reference- 09-2146 of 31 march 2010. **Note** – Rehabilitation (including rubbish removal) has been completed by KCC in accordance with approved Rehabilitation Plan (See Appendix B of this report).

Complaint	Engineer Response
According to Clause 2.4 of Social and Ecological measures plan (environmental mitigation measures) borrow pits 'zones must not be visible from the road. It is not allowed to excavate soil and leave holes on these sections. PMC and MOTC are responsible for implementation of the above-mentioned measures. Borrow pits (200*300 meters size) with scrap edges (8-15 meters) left near villages are dangerous for village dwellers and animals. During development of borrow pits near Aksholak village and Zhanaturmys safety labor requirements were not observed. Edges is 8-15 meters depth, Overburdens are stockpiled on the failure berm. Open developments of the loam and gravel must be carried out on the condition that the edges is 5 meters and less, angles slope is 1:0.75 – 1:1 However, during rehabilitation work there is a risk of landslides.	The Contractors will implement rehabilitation works in 2012 as part of their obligations for Contract completion. **Note** – Rehabilitation has been completed by KCC in accordance with approved Rehabilitation Plan (See Appendix B of this report).
In August 2011 we inspected "Sarykemer – 2" borrow pit together with journalist G. Vybornova as local dwellers had written a claim. According to protocols #40/11 and # 1419-GN of Interregional department "Uzhkaznedra" confirmed reserves are 405.4 thousands of cubic meters. KCC E&C/Zhambyl Zhol Kurylys could not legally excavate 500 thousand cubic meters of sand-gravel mixture on the borrow pit "Sarykemer -2" in 2011-2012. In accordance with letter # 06-3223 dated 08.11.2010 of Baizak region's Akim KCC started to deepen Talas river bed (by 3-4 meter) and dig by-pass canal of 20 meters width and 1000 meters length. Head of Prosecution Department of Zhambyl Oblast I. Toishibekov instructed Shu-Talass ED to conduct an inspection. ED instructed contractors to conduct rehabilitation works in the water protection zone and Talas river bed. Rehabilitation works were carried out in November 2011	The Contractor submitted his reply on Sarykemer 2 as Item 2 of KCC response In summary river work was requested by Akim of Baizak region as part of flood protection / mitigation for nearby villages
Observance of waste accumulation and Placement Legal entities must develop measures of waste disposal appeared as a result of contractors activity. Contractors must observe ecological and sanitary- epidemiological requirements and fulfill measures of waste utilization and disposal. Department of Ecology informed in their references about excessive placement of waste (claim 380368) and absence of container area for waste accumulation and storage	As part of Contractor's environmental management plans (and duties) all Contractors have negotiated contracts with approved / licensed companies for the collection and removal of waster products from the site.
Assessment of soil impact. The road from 210-260 km. has been reconstructed and built on the existing road without affecting of additional lands. The trees along the road are not cut. The temporary black- paved road that was constructed on the left and right side of the highway (251 km.) is still used by local people who asked not to destroy this temporary road. Local people plan to use this road for agricultural equipment transportation.	It will be necessary to cut some trees for safety reasons. The engineer will minimize the number that must be removed however unfortunately there are some locations where trees are located on the road shoulders and as such they present a hazard for visibility, driver safety and formation of road ice (the ice does not melt as it is in the shadow of the trees). This will be examined on site with ADB environmental specialist. Subsequently some trees have been pruned rather than being removed, The Contractor has rehabilitated borrow pits in accordance with approved plan.

Complaint	Engineer Response
Electromagnetic radiation (Power Lines) Three high-voltage lines (10-35 kw.) from the left side of the road cross the road because electric power substation is located in 70 meters. Distance of the wires of air power lines in the section of crossing till the carriageway is approximately 5 meters. According to power lines' safety requirements distance of wires from carriageway must be the following: • 6 meters – if voltage is less than 1 kw • 7 meters – if voltage is 110 kw • 8 meters - if voltage is 220 kw. • 9 meters – if voltage is 500 kw. These requirements are not observed as the road is constructed in 1.0 or 2.0 meters from former carriageway. The embankment of the new road is raised by 1.0 - 1.5 meter in the control points # 47 (Aksholak village) and control points # 52 (Aksholak village, turn to Tuimekent village, power lines are at the same level). At the present moment EP lines are swaging over the road at a height of 4.5-5 meters. New road is open for traffic and there is no warning and compulsory signs near the borders of sanitary-protection zone of EPL. Electrical power lines (35kw) cross the road in Akyrtobe village and 220 kw. power lines cross the road in Aksholak village. The distance between PL and the carriageway in Akyrtobe must be no less than 6 meters and in Aksholak this distance must be 8 meters.	Cables across the road are being raised where necessary in accordance with national norms. This is primarily for reduction of sudden electrocution risk, but presumably also covers electromagnetic radiation impact. Such impact should be a consideration only for persons living permanently close to such cables. The measured height is >10metres for cables. There is no issue. The table of results has been re-checked (again} and confirmed. The lowest recorded cable height is 6.02m at Km 457+552 for a 0.4kva line. This complies with Kazakhstan norms. Lines at Aksholak are >6.0m for 0.4kva lines and >7.0m for 10kva lines. Line at Aktobe are >6.0m for 0.4kva and >7.0m for 10kva.

Complaint	Engineer Response
Estimate of radioactive substances Chu – Illiskii range of mountains is a territory of radioactive ore occurrence. Uranium mines were developed in 1950's near Muzbel village. Small river (tributary of Kalguty river) flows from submerged borrow pit. Rivers flowing from south slopes of Chu – IlliskiiMountains can bring radionuclides together with fragmentary materials into Chu valley. Material that is used for construction of the road without quality certificates should be tested for radionuclide content. Because of lack of devices and money monitoring group could not check background radiation along the road. In order to protect local population from radiation the following requirements must be observed: • Natural background must not exceed 0.3 mk.zv/h on the construction site • Radio nuclides content must not exceed indexes identified in NRB - 99 and KPR -96 • Content of radon gas in soil air must not exceed 50 bk/l In 1950 uranium deposits prospecting work were conducted on the north slope of Kyrgyz range of mountains in Merke region. Large deposits were not found. However there are some radioactive abnormalities and radioactive well springs quite dangerous for humans. Rivers (Aspara, Merkenka, Karakystak) flowing from south slopes of Chu – IlliskiiMountains could bring radionuclide together with fragmentary materials into valley. Material that is used for construction of the road without quality certificates should be tested for radionuclide content.	The main risk is for a Contractor to utilize materials for construction from a radioactive source. Main sources of materials coming from the hills near Korday have been tested (Alga, Aktas, Kakpatas & Technogranit) and are classified as conforming to Class I construction materials according to Appendix A, GOST 30108-94 & NRb-99.
Impact on historical and Cultural Monuments Historical and cultural monuments are located on the both sides of the new bypass road stating from Otar to Kainar village (98 km stretch) in the protection zone of 200 meters length. Monuments were found out by ltd "Archeological expertise" (act #AR 12/16 dated 10.09.2008). In accordance with Expertise Act (c/3) on the section of the road 162-260 km. "10 objects are archeological monuments, 6 of the monuments are located on the line of the road axis, 4 monuments are located in buffer zone of road axis.	Fencing of cemeteries is not included in the Project Design or Bill of Quantity.

Complaint	Engineer Response
Industrial noise and Vibration Impact. Permissible level of traffic noise is 70 Db. The following factors influence on noise of level: • Category of road and purpose of road construction • Characteristics of transport stream • Constructive peculiarities of road • Technical condition of road • Time of day • Top soil of adjoining territories These factors and combination of factors can change intensity of transport stream's noise by 5-10 Db. Health standards of maximum permissible level of noise approved by Ministry of Health of RK #841 dated on 03.12.2004 is 80 Db (from 7 a.m.) and 45 Db (from 11p.m to 7 a.m) in the residential zone. Noise monitoring was conducted just in case of local dwellers' claims. In December 15th 2010 a meeting was held in order to find the reason of cracks formation in the houses of Zhanaturmys village. Houses of Zhanaturmys village are located in 40 meters from the carriageway. Village dwellers were satisfied with made decision. There were two large earthquakes (6-8 magnitude) in T.Ryskulovskii regions. Microseismic movement is still going on. Lots of earthquakes with magnitude of 3-4 can be registered by means of special device if the magnitude of the earthquake is 4-5 some cracks can appear. According to SanPin RK 3.01.032-97 sanitary vibration norms in the houses must not exceed: • Vibro rooms – from 91 to 133 Db • Vibratory acceleration – from 75 to 87 Db • Vibratory speed – from 67 to 72 Db	All Contractors implement monthly vibration and noise monitoring on a regular basis. This is reported monthly in the Contractor's Environmental reports. In Villages such as Stepnoe and Zhambyl vibratory machinery was not permitted near houses and working hours were strictly controlled to daytime. Watering of detours was strictly controlled to minimize dust and discomfort to residents. This continued to construction completion as part of management policy.

Complaint	Engineer Response
Assessment of construction impact on social life Impact of construction and transport works repair on socioeconomic environment is usually evaluated by quantitative index of transport pollution, land acquisition for road and protective belt, structures demolition, disruption of fully developed infrastructure. Mitigation measures provided by project on disamenity of road construction, reduction of toxic emissions, noise, harmful effect on flora and fauna, watercourse pollution prevention have direct relation to health and social population life. Landscape – architectural road view and aesthetic impression are to be changed better after implementation of road tree planting project. For the first time cattle crossings, agricultural over/under passes are being constructed on Republican road. Smoothness of road in longitudinal and traverse profiles will reduce accidents. 50 m right-of-way widening in either side from road will reduce fire risk for agricultural crop. There will be travel time reduction for goods and population transportations. Additional enterprises will be opened and work positions will be increased. After reconstruction road will improve transport connections of KazakhstanRepublic. The south of Kazakhstan will be touristic cluster zone (Aksu-Zhabagly reserve, Aisha-Bibi monument, Akyr – Tasa complex, Arslanbaba temple, Yassavy mausoleum). However loss of agricultural lands, plazas will be serious experience for many people. After reconstruction road will improve transport connections of KazakhstanRepublic. The south of Kazakhstan will be touristic cluster zone (Aksu-Zhabagly reserve, Aisha-Bibi monument, Akyr – Tasa complex, Arslanbaba temple, Yassavy mausoleum). However loss of agricultural lands, plazas will be serious experience for many people.	The Engineer concurs with NGO Comments.
In spite of the fact that the issues on observing labour rights of workers involved in the project "Western Europe – Western China" weren't reviewed intentionally at meetings and during discussions workers said that they worked without off days in "speedup system" (according to their words) and had unsatisfactory living and working conditions – lack of payment for business trip expenditures or their unconformity with foreign specialists' sums, non- payment of compulsory social and pension accruals	We request that the NGO present hard facts as we have had no negative feedback from workers on conditions and payments. Contractors are following Kazakhstan requirements. We regularly inspect canteens, living quarters, sanitary conditions on all Contracts as part of our monitoring works.

Complaint	Engineer Response
Section of the road 210-260 km. Air pollution during the construction of the road. The sanitary-protection zone where the containments must disperse to maximum permissible concentration is not fixed in the design. It is said that containments dispersion occurs on the border with dwellings zone. It is doubtful that the dispersion will be the same at the distance of 5-10 meters from the roadway and at a distance of 50-70 meters where the houses are located According to article 28, clause 6 of Ecological Codex, the emission standards from transports is established as maximum concentration of containments that are contained in exhaust. Transport emission is defined in accordance with specific standards. The present transport corridor is not being constructed for transport over speeding (number of trucks equals to 10% of transient transport). Kiosks and trade containers of "Barys" market near Kordai village are located at a distance of 7-10 meters from the roadway. It is obvious that the level of noise and air pollution will exceed the indexes of established standards. According to SANPIN the protection zone from the roadway to market is 30 meters.	The Contractor has obtained a permit for air pollution due to construction activity from the Department of Natural resources and Natural Regulations of Zhambyl Oblast Akimat (H No 0000432). The Contractor is carrying out the monitoring of air quality as part of the monthly environmental monitoring program including locations along the road. This work is implemented under Contract by Shu-Talas Department of Ecological Committee. To date there are no excessive levels recorded. The Engineer would suggest that the issues related to NOx pollution in the "Desktop" modeling used in the IEE are non-existent and that the impact of construction traffic is minimal. Construction traffic would add <1% daily traffic to current vehicle movements. In 2010 the Contractor did not operate construction traffic through Korday village. Trucks carrying asphalt use an alternate route avoiding Korday village. In relation to the Barys Market in Korday the Contractor is implementing works in accordance with the design of the company "Kazdorprokekt". The design has been approved under State Expertise Commission and by Employer. The design is following the existing road alignment for 99% of total distance including the market section. This design includes three pedestrian crossings and decorative safety fencing. It is expected the walls of the market pavilions will absorb traffic noise.
Conclusions According to official data estimated cost of "Western Europe – Western China" project is 902, 2 billion KZT (7, 5 billion USA dollars). This credit comes upon Kazakhstan people. We want to be assured that we'll get adequate quality, benefits and development	The Engineer also want to ensure good quality , lasting works with only minor road maintenance works being required and to also ensure that local population is not disrupted and disadvantaged by the project.
The following issue must be also examined: According to the work of quite "expensive" foreign specialists there are no ecological, social or technical breaches. However, if we take into account the breaches that were found out by our monitoring group in 2009-2011 some doubts appear in professional skills of foreign specialists. Engineers allow to use material extracted from illegal borrow pits, the do not pay attention the breaches of labor camps operation; engineers do not notice that the houses are located in the right-of-way. The same we can say about managers of and PMC.	We would point out that we have invited the NGO to come and discuss issues and to do joint site inspections at any time they so wish. When Engineers Foreign Environmental specialist was at the site in February 2012 the NGO was invited several times to come and meet and discuss issues related to rehabilitation / Sarykemer and general environmental issues – They did not come.

Complaint	Engineer Response
SUMMARY OF CONSTRUCTION SUPERVISION ENGINEER The above responses of the Engineer and those given by the Contractors in Appendices 4, 5 and 6 are intended to clarify the issues raised by the NGO; however in many cases the comments made by the NGO are "broad statements" - without supporting information that can enable the Engineer to respond in a specific manner. Several issues raised were extracted from the NGO 2010 report to which we have replied with clarifications. We however agree that the role of the NGO "Taraz Press Club" as an important external monitoring role as it has made some good and positive contributions to the project (such as Ornek). We are willing to work closely with the NGO's on project issues as many issues raised in NGO reports are already resolved by the Engineer / Employer. This can ensure all parties have the same information and can communicate on an issue on known base facts. Often there is a lack of clarity in the project information. We object to the questioning of the professional capacity of our foreign specialists as they have contributed significantly to the project and ensured the development and implementation of the Contractors environmental Monitoring and reporting systems on all Contracts, and the adherence to ADB monitoring requirements. This is a significant step for local Contractors. Our foreign specialists are engaged only on short term inputs over the life of the project (5 months over 3 years) and there was no provision for Local specialist in the Supervision Contract (an issue which the Engineer has raised from the commencement of the project). As such monitoring has come under the control of the Engineer and his field staff as an additional task to the overall construction supervision role.	

5. Rating of Contractor Environmental Performance by Senior Environmental Specialist

The environmental performances of the three contractors were rated against the following criteria:

1. Adequacy of monthly environmental reports;
2. Timeliness of reports
3. Timeliness of responses to Engineer queries;
4. Reference documentation provided with reports;
5. Apparent impact on contractor construction methodologies;
6. Adoption of safety practices during site inspections.

Each criterion was scored out of ten (10)

Contract	Evaluation Criterion						Total Score
	1	**2**	**3**	**4**	**5**	6	
001	7	2	3	3	6	6	**27**
002	8	8	8	8	7	4	**43**
003	8	7	8	6	6	8	**41**

As evaluated Contract 002 was marginally better than C003. Both were significantly better than C001.

Appendix A

Specification 106 –Protection of the Environment

Specification 106 –Protection of the Environment

A - General

The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the Works and all associated operations on site or off-site are carried out in conformity with statutory and regulatory environmental requirements including those prescribed elsewhere in this document.

The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Works. This shall wherever possible be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated.

The provisions of these Sub-Clauses shall be disregarded in respect of emergency work required for the saving of life or property or the safety of the Works.

In the event of any spoil or debris or silt from the Sites being deposited on any adjacent land, the Contractor shall immediately remove all such spoil debris or silt and restore the affected area to its original state to the satisfaction of the Engineer.

The Contractor shall provide an environmental mitigation and monitoring plan in connection with the submission of the Program based on the provisions set forth in these Technical Specifications. The Engineer may interrupt the Contractor's work, if the provisions of the approved environmental plan are not followed. The Contractor shall also nominate one of his senior staff members to be responsible for follow-up of the implementation of the provisions of the environmental plan as well as for the guidance of the rest of the staff and reporting to the Engineer.

The environmental monitoring and management plan shall be provided as a part of the method statement of the Contractor's proposed arrangements and methods of execution of the works required by Section 109 of these Technical Specifications. The environmental plan shall include, but need not necessarily be limited to:

i) **Siting of Construction Camps**, Asphalt Plants, Cement Plants and Related Facilities. The siting, construction and environmental restoration of facilities for the housing of construction personnel, the storage of equipment and vehicles, labour camps, asphalt plants and similar facilities must be planned to the satisfaction of, and are subject to the approval of, the Engineer, including facilities that are privately negotiated.

ii) **Air Quality Monitoring.** The environmental plan shall specify proposed pre-construction monitoring to verify baseline conditions at locations as determined advisable by the Engineer. Pre-construction monitoring of total suspended particulate (TSP) is required at not less than two points as determined on the basis of actual construction plans, including the specific locations of pollution sources (e.g., asphalt plants). Additional baseline monitoring at the request of the Engineer may be required in the event that

unforeseen circumstances are encountered.

The environmental plan shall specify the locations and frequency of routine instrumented monitoring of air pollutants, including but not necessarily limited to, the same locations as the earlier baseline monitoring points. Air quality monitoring is required not less than once per month at each location and more frequently if determined necessary by the Engineer. Additional air quality monitoring may be required at the request of the Engineer if warranted by events.

The Contractor should note that, in addition to the provisions for the siting of asphalt plants, the following provisions to limit air quality impacts shall apply:

a) Open burning is prohibited.

b) Solvents and volatile materials must be used properly to the satisfaction of the Engineer.

c) Blasting (if any) is carried out using small charges.

d) Dust-generating items will be conveyed under cover.

e) Road surfaces, excavation and construction sites will be water sprayed to keep them moist for dust control as determined advisable by the Engineer.

f) Trucks carrying earth, sand or stone will be covered with tarps to avoid spilling.

iii) **Water Quality Monitoring.** The plan shall specify pre-construction monitoring to verify baseline conditions at locations as determined advisable by the Engineer. Pre-construction monitoring of water quality is required for suspended solids (SS), biological oxygen demand (BOD), dissolved oxygen (DO), conductivity and faecal coliform, and oil and grease levels. Additional baseline monitoring may be required by the location of major sources of potential water pollution (construction camps and other sources of significant runoff and liquid waste generation). The plan shall specify procedures for routine instrumented monitoring of water quality and runoff from construction camps, staging areas and labour camps, not less than once every month. Monitoring shall include measurements of suspended solids (SS), biological oxygen demand (BOD), dissolved oxygen (DO), conductivity and faecal coliform, and oil and grease. Additional routine water quality monitoring may be required at the request of the Engineer, if warranted by events (e.g., oil spills, indents involving hazardous materials, etc.)

iv) **Noise & Vibration Monitoring.** Instrumented monitoring is required over a period of time prior to the initiation of construction to verify baselines against which impacts can be measured. Pre-construction baseline monitoring of noise and vibration levels is required at not less than two points. These shall include, but need not necessarily be limited to, major settlements along the road. Additional baseline monitoring may be required at the request of the Engineer in the event that unforeseen circumstances are encountered.

Routine instrumented monitoring of noise and vibration levels are required at not less than two locations, including the same locations as the earlier baseline monitoring. Instrumented monitoring shall be required not less than once per month and more frequently if determined necessary by the Engineer. Additional noise and vibration monitoring during pile driving and blasting or if otherwise warranted in the judgment of the Engineer may be required.

v) **Community Relations.** The environmental plan shall specify proposed public information programs in advance of construction, notification procedures, etc.

All instrumented monitoring of air quality, water quality, noise and vibration shall be undertaken by third-party organizations found acceptable to the Engineer.

B - Fuel and Chemical Storage

All fuel and chemical storage shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110% of the volume of tanks. Filling and refueling shall be strictly controlled and subject to formal procedures.

All valves and trigger guns shall be resistant to unauthorised interference and vandalism and be turned off and securely locked when not in use.

The contents of any tank or drum shall be clearly marked.

Measures shall be taken to ensure that no contaminated discharges enter any drain or water courses.

C - Water Quality

The Contractor shall prevent any interference with the supply to or abstraction from or the pollution of water resources (including underground percolating water) as a result of the execution of the Works.

Areas where water is regularly or repetitively used for dust suppression purposes (including without limitation stockpiles for concrete-batching and asphalt plants) shall be laid to fall to specially-constructed settlement tanks to permit sedimentation of particulate matter. After settlement, the water may be re-used for dust suppression and rinsing.

All water and other liquid waste products arising on the Sites shall be collected and disposed of at a location on or off the Sites and in a manner that shall not cause either nuisance or pollution.

The Contractor shall not discharge or deposit any matter arising from the execution of the Works into any waters except with the permission of the Engineer and the regulatory authorities concerned.

The Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept safe and free from any debris and any materials arising from the Works.

The Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution, silting, flooding or erosion as a result of the execution of the Works.

The Contractor shall submit details of his temporary drainage work system (including all surface channels, sediment traps, washing basins and discharge pits) to the Engineer for approval prior to commencing work on its construction.

D - Air Quality

Open burning is prohibited. Solvents and volatile materials are to be used properly to the satisfaction of the Engineer.

The Contractor shall utilise effective water sprays during the delivery and handling of materials when dust is likely to be created, and to dampen stored materials during dry and windy weather.

Stockpiles of materials shall be sited in sheltered areas or within hoarding, away from sensitive areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, except where this is contrary to the Specification.

Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend at least 300 mm over the edges of the side and tail boards.

In periods of high wind, dust generating operations shall not be permitted within 200 m of residential areas having regard to the prevailing direction of the wind.

Construction vehicles and machinery shall be kept in good working order and engines turned off when not in use. Appropriate measures shall be taken to limit exhaust emissions from construction vehicles, machinery, and plant and the Contractor shall include details of such proposed measures in the mitigation and monitoring plan to be submitted to the Engineer in accordance with the sub item 4.18 of Conditions of Contract.

In residential areas or other sensitive areas such as nurseries and hospitals etc., advance warning shall be given to potentially affected persons, so that some measures can be taken by them before commencement of works.

E - Noise

The Contractor shall consider noise as an environmental constraint in his planning and execution of the Works.

The Contractor shall use plant and equipment conforming to international standards and directives on noise and vibration emissions and shall include details of measures for abating noise at source in the mitigation and monitoring plan to be submitted to the Engineer according to sub item 4.18 of Conditions of Contract, arrangement description for resource noise abating.

The Contractor shall take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environment requirements. The Contractor shall use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimise the noise emission during construction works.

When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor's hours of working shall be limited to 08h00 to 18h00.

F - Earthworks

Surplus excavation and topsoil shall wherever possible be used to reinstate borrow pits and quarries or other areas as may be approved by the Engineer. Such materials shall be spread in such a manner as to limit subsequent erosion and shall be re-vegetated as existing ground cover dictates.

G - Preservation of Antiquities

The Contractor shall take all necessary measures to protect any antiquities or archaeological finds as required by the sub-point 4.24 of Conditions of Contract.

Where antiquities are shown on the drawings or otherwise identified during the course of the Works, these shall be protected by means of suitable fencing and barriers to the satisfaction of the Engineer. The Contractor shall provide and maintain access at all times for persons wishing to stop and pay their respects.

H - Environmental Enhancement

On completion of the Works the Contractor shall reinstate all areas with natural vegetation to the satisfaction of the Engineer.

The Contractor shall remove all old tyres and internal tubes from within the Limits of Site, and subject to the agreement of adjacent land owners, from an additional area 75m either side of the road centre line. The Contractor shall dispose of all materials in a manner approved by the Engineer.

Where directed by the Engineer, the Contractor shall improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils, re-grading to natural ground levels, and re-establishing the natural vegetation where appropriate. All debris and contaminated materials shall be disposed off site as approved by the Engineer.

Appendix B

Photos of Quarry and Borrow Pit Rehabilitation

Contract 001 - AKM

Examples of AKM rehabilitation works – culvert outlet (above) and cattle crossing (below)

Examples of AKM rehabilitation works – Road shoulder and diversion track rehabilitation works in progress

AKM Rehabilitation of local road intersections

Contract 002 - Kazakhdorstroy

Photos taken 15 March 2013

Site 1 – Km 411 – 1.21 ha – Storage of Top Soil Material


15/03/2013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Contract 003 - KCC

Sarykemer 2 Quarry

Photos taken 6 March 2013



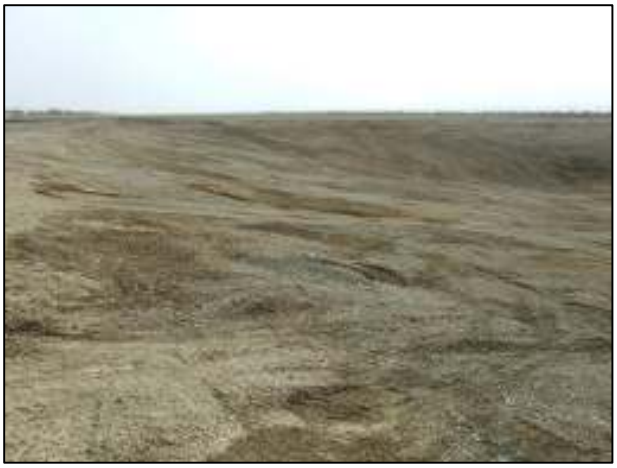



Aksholak -1 Quarry

Photos taken 6 March 2012

Aksholak - 2 Quarry

Photos taken 6 March 2012



Albagas - 1 Quarry

Photos taken 6 March 2012

Albagas - 2 Quarry

Photos taken 6 March 2012

Albagas - 3 Quarry

Photos taken 6 March 2012

Appendix C

Contractors Summary Monthly Environmental Reporting July to October 2012

Contract 001–AKM

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
General					
1 Contractor shall provide Environmental Mitigation and Monitoring Plan (CEMMP) in connection the submission of the Program based in the TS	1.1 Plan provided	Y			CEMMP and the program based in the Technical Specification were presented and agreed with the Engineer on 20 June 2010
2 Contractor shall nominate a senior staff person to be responsible for follow-up of implementation of CEMMP and for guidance of Contractor staff and reporting to Engineer	2.1 Person appointed	Y			Eldos Mendekeev on 18 July 210– CV provided
	2.2 Guidance provided to Contractor staff	Y			Guidance of the contractor staff has been accomplished.
	2.3 Reports prepared for Engineer	Y			Reports on works executed and monitoring in May, June, July, August, September and November 2010 and January – October 2011 were submitted earlier
3 CEMMP shall be provided as part of the method statement	3.1 CEMMP provided with method statement	Y			CEMMP is a part of the document on execution of the works
Siting of Camps, Asphalt Plants, Cement Plants and Related Facilities					
4 Siting construction and environmental restoration of facilities for housing construction staff, storage of equipment & vehicles, labour camps, asphalt plants and similar facilities must be planned to the satisfaction of the Engineer	4.1 Plans submitted to Engineer		P		Plans of campsite, crushing and asphalt plants have been submitted to authorised bodies
	4.2 Engineer indicates he is satisfied	Y			Plans to be submitted to Engineer in near future

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality Monitoring					
5 Contractor shall provide Environmental Mitigation and Monitoring Plan (CEMMP) in connection the submission of the Program based in the TS	5.1 Pre-construction AQ monitoring included in CEMMP	Y			Pre-construction monitoring undertaken and results of pre-construction AQ monitoring included inCEMMP. Protocols on monitoring of air, noise and vibration previously submitted
	5.2 Site advice provided by Engineer	Y			Contractor has undertaken air quality monitoring in villages prior to construction.
6 Pre-construction TSP monitoring at not less than 2 points depending on proposed location of pollution sources	6.1 Monitoring points identified	Y			Monitoring of baseline indicators was conducted at the crushing plant and asphalt plants at Alga
	6.2 Additional baseline monitoring required by Engineer			N	Additional baseline monitoring was not requested by Engineer
7. CEMMP shall specify locations and frequency of routine instrumented monitoring of AQ	7.1 Locations specified	Y			Air quality monitoring was undertaken at location of pollution sources (Asphalt Plant, Crushing-Sorting Plant, road construction sections, sandy gravel mix quarry) not less than once per month.
8. AQ monitoring required not less than once per month	8.1A Q monitoring frequency monthly	Y			Monitoring of air quality undertaken once a month. .
9. Additional event-related monitoring may be required by Engineer	9.1 Additional monitoring required			N	Additional monitoring was not required.
10. Monitoring undertaken by third party organisations acceptable to Engineer	10.1 Engineer acceptance received	Y			Testing laboratory for instrumental measurement is accepted.
11. Following AQ provisions apply to AMP	11.1				
a. Open burning prohibited	a Prohibition implemented	Y			Open burning is not conducted.
b. Solvents & materials used to Engineer's satisfaction	b Material use satisfactory	Y			Daily analyses of used materials undertaken
c. Blasting limited to small charges	c Blasting complies			N	No blasting works
d. Dust generating items conveyed under cover	d Requirement implemented	Y			Photos have been provided.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality Monitoring (ctd)					
e. Road surfaces, excavations & construction sites water sprayed for dust control	e Dust controlled by spraying	Y			Photoshave been provided.
f. Trucks carrying earth, sand or stone covered with tarps to avoid spilling.	f Trucks covered with tarps	Y			Photoshave been provided.
Water Quality Monitoring					
12. CEMMP shall include pre-construction monitoring to verify baseline conditions at locations as advised by Engineer	12.1 Pre-construction monitoring included in CEMMP	Y			There are two rivers at the road section being reconstructed: the Kakpatas River and Kalguty River, there is also the left branch of the Georgievsky canal.
	12.2 Site advice provided by Engineer	Y			Engineer provided site advice
13. Pre-construction WQ monitoring to include suspended solids (SS), biological oxygen demand (BOD) and dissolved oxygen (DO), conductivity, faecal coliforms and oil & grease	13.1 Required parameters included in pre-construction WQ monitoring	Y			Required parameters were included in pre-construction monitoring
14. Additional baseline monitoring may be required by location of major sources of potential water pollution (construction camps & other sources of significant run-off & liquid waste generation)	14.1 Additional baseline monitoring undertaken			N	No additional baseline monitoring required

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Water Quality Monitoring (ctd)					
15. Plan shall specify procedures for routine instrumented monitoring of WQ & run-off from construction camps, staging areas & labour camps, at least 1 time per month	15.1 Procedures specified in CEMMP	Y			Included in CEMMP.
16. Monitoring to include SS, BOD, DO, conductivity, faecal coliforms, oil & grease.	16.1 Monitoring includes required parameters	Y		N	Included in CEMMP.
17. Additional event-related monitoring may be requested by Engineer	17.1 Additional event-related monitoring requested by Engineer			N	Additional monitoring activities were not requested.
18. Monitoring undertaken by third party organisations acceptable to Engineer	18.1 Engineer acceptance received	Y			Engineer approval received
Noise and Vibration					
19. Pre-construction baseline monitoring of noise and vibration required at minimum of 2 sites including major settlements	19.1 Pre-construction monitoring undertaken	Y			Baseline monitoring undertake as required. Results provided in first Six Months Report, July 2010
20. Additional baseline monitoring may be required by Engineer	20.1 Additional monitoring required by Engineer	Y			As requested by the Engineer, additional monitoring was undertaken in communities along the road.
21. Routine instrumented required at minimum 2 locations including baseline monitoring sites	21.1 Routine monitoring undertaken	Y			Instrumented monitoring undertaken at required sites
22. Monitoring required at least 1 time per month	22.1 Monitoring frequency as required	Y			Monitoring was undertaken once per month.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Noise and Vibration (ctd)					
23. Additional monitoring may be required during pile driving and blasting and otherwise as requested by Engineer	23.1 Additional monitoring undertaken			N	No pile driving and blasting activities.
24. Monitoring undertaken by third party organisations acceptable to Engineer	24.1 Engineer acceptance received	Y			See item 24.1.
Community Relations					
25. CEMMP shall specify proposed public information programs in advance of construction, notification procedures etc	25.1 Program included in CEMMP	V			Informing local communities achieved by mass media, Internet, meetings with the population through village Akims, booklets, etc.
Fuel and Chemical Storage					
26. Fuel & chemical storage shall be sited on impervious base within a bund and secured by fencing	26.1 Impervious bund and fencing provided			N	Not required - Road construction equipment refueled with specialized transport and Gasoline Station (Contract with the "Aldiyar" Gasoline Station # 15/07/01 dated by July 1, 2010).
27. Storage located away from watercourse and wetlands	27.1 Appropriately located			N	See item 26.1.
28. Bund base and walls impermeable	28.1 Impermeability satisfactory			N	See item 26.1.
29. Capacity of bunded 110 % of the volume of tanks within bund	29.1 Pre-construction monitoring undertaken			N	See item 26.1.
30. Filling and refueling strictly controlled & subject to formal procedures	30.1 Procedures developed and implemented	Y			In the case of spilling during refueling of construction transport the contaminated soil iwas removed. Each machine is provided with fire-extinguisher for fire safety. .

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Fuel and Chemical Storage (ctd)					
31. Valves & trigger guns shall be resistant to unauthorised interference and vandalism and be turned off and securely locked when not in use	31.1 Valves and trigger guns comply with requirements	Y			See item 26.1. Equipment is under around the clock observation
32. Contents of any tank or drum shall be clearly marked	32.1 Contents clearly marked in Russian language			N	No tanks or drums stored on construction sites. See item 26.1.
33. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses	33.1 Measures implemented	Y			See item 26.1
	33.2 Any contaminated discharges entering drain or water course			N	See item 26.1
Water Quality					
34. Contractor shall prevent any interference with supply or abstraction from supply or pollution of water resources including groundwater	34.1 Any interference with supply	Y			Project includes upgrade of bridges across Kakpatas and Kalguty Rivers and GM Canal. Work methods designed to include measures to prevent pollution of waterways and surrounding areas
	34.2 Any pollution of surface or groundwater			N	No pollution due to safeguards (see above)
35. All water and other liquid waste products arising on sites shall be collected on or off the sites and in a manner that shall not cause nuisance or pollution	35.1 All liquid & other wastes collected			N	No liquid wastes to collect
	35.2 Manner of collection not causing pollution			N	See above.
36. Contractor shall not discharge or deposit any matter arising from execution of the Works into any water except with permission of Engineer and regulatory authority	36.1 Requirement implemented	Y			No deposit or discharges occurred without prior Engineer or Regulatory Authority approval
	36.2 If discharges, prior Engineer approval obtained	Y			See above
	36.3 If discharges, prior regulatory authority approval obtained	Y			See above

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Water Quality (ctd)					
37. Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept free from any debris and materials arising from the Works	37.1 Stream courses and drains kept free of debris and materials arising from the Works	Y			During works on bridges and road sections adjacent to waterways safeguards were implemented and following construction measures were undertaken to clean up bridge approaches and adjacent construction sites.
38. Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution, silting, flooding or erosion as a result of the execution of the Works	38.1 All waterways protected	Y			See above. In addition, large gravel was emplaced along river banks to provide additional protection against erosion
39. Contractor shall submit details of his temporary drainage system (including all surface channels, sediments traps, washing basins and discharge pits) to the Engineer for approval prior to commencing work on its construction.	39.1 Details submitted to Engineer prior to construction	Y			Details submitted to the Engineer as required
Air Quality					
40. Open burning prohibited	40.1 Specification complied with	Y			Open burning is not conducted.
41. Contractor shall utilise effective water sprays during delivery and handling of materials when dust likely to be created and to dampen stored materials during dry and windy weather	41.1 Water sprays utilised	Y			Photos were attached in monthly reports of the second half 2011.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality (ctd)					
42. Stockpiles of materials shall be sited in sheltered areas or within hoarding, away from sensitive areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material shall be dampened prior to their movement, except where this is contrary to the Specification	42.1 Material stockpiles sited in sheltered areas or within hoarding			N	Material stockpiles are not fenced because they are located far from villages.
	42.2 Stockpiles of friable material covered with clean tarpaulins and sprayed with water		P		All loads covered by tarpaulins – water sprays not used
	42.3 Stockpiles dampened prior to movement			N	See above
43. Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards	43.1 Properly fitting side and tail boards provided	Y			All loading vehicles were provided with properly fitting side and tail boards.
44. Materials having potential to produce dust shall not be loaded to a level higher than the side and tail boards and shall be covered with a clean tarpaulin in good condition. Tarpaulin shall be properly secured and extend at least 300mm over the edges of the side and tail boards	44.1 Loads comply with loading requirement	Y			Implemented during construction
	44.2 Tarpaulins clean and good condition	Y			Implemented during construction
	44.3 Tarpaulins secured as per specification	Y			Implemented during construction
45. In periods of high wind, dust generating operations shall not be permitted within 200m of residential areas having regards to the prevailing direction of the wind	45.1 Operations comply with specification	Y			Implemented during construction

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality (ctd)					
46. Construction vehicles & machinery shall be kept in good working order and engines turned off when not in use.	46.1 Vehicles & machinery kept in good working order	Y			Repair works are executed by Contractor on the territory of the Professional Lyceum # 7 workshop (Lease Contract of the premises # 123 dated by October 21, 2010).
	46.2 Engines turned off when not in use	Y			Implemented during construction
47 Appropriate measures shall be taken to limit exhaust emissions from construction vehicles emissions from construction vehicles, machinery & plant & contractor shall include details in CEMMP	47.1 Measures taken to limit exhaust emissions from vehicles & plant	Y			All road construction machinery is provided with filters for exhaust gases.
48. In residential or other sensitive areas such as nurseries and hospitals etc, advance warning shall be given to potentially affected persons, so that measures can be taken by them before commencement of works	48.1 Details included in CEMMP	Y			Nearby residents notified before construction
	48.2 Assistance with mitigation measures provided to project affected people (PAP)	Y			Haul road through village adjacent to Kalguty Quarry and diversion tracks sealed with milled asphalt to reduce dust generation.
Noise and Vibration					
49. Contractor shall consider noise as an environmental constraint in the planning and execution of the Works	49.1 Noise considered by Contractor as environmental constraint	Y			Construction activities restricted to Monday to Friday between hours of 8.00am and 6.00pm
50. Contractor shall use plant and equipment conforming to international standards and directives on noise and vibration emissions	50.1 Plant and equipment conforms with international standards for noise and vibration	Y			Crusher (located at “MBT” LLP quarry)conforms to International standards (Euro 3).

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Noise and Vibration (ctd)					
51. CEMMP shall include details for abating noise at source as per sub-item 4.18 of Conditions of Contract	51.1 CEMMP includes required details for abating noise at source	Y			See item 50.1.
52. Contractor shall take all necessary measures to ensure that the operations of all mechanical equipment and construction processes on and off-site shall not cause unnecessary or excessive noise, taking into account applicable environmental requirements.	52.1 All necessary measures taken	Y			See item 50.1.
	52.2 Noise levels in accordance with applicable environmental requirements	Y			Monitoring results demonstrate that construction and plant and vehicle noise levels comply with relevant environmental requirements
53. The Contractor shall use all necessary measures and maintain all plant and silencing equipment in good condition so as to minimise noise during Works	53.1 All necessary measures taken	Y			See item 50.1.
	53.2 Silencing equipment maintained in good condition	Y			See item 50.1.
54. When operating close to sensitive receptors such as residential, nursery, or medical facilities, the Contractor's hours of working shall be limited to 0800 to 1800	54.1 Construction close to sensitive receptors restricted to 0800 to 1800 timeframe	Y			Construction activities restricted to Monday to Friday between hours of 8.00am and 6.00pm
Earthworks					
55. Surplus excavation and topsoil shall wherever possible be used to reinstate borrow pits and quarries or other areas as may be approved by the Engineer	55.1 Surplus excavation and topsoil used to reinstate borrow pits and quarries	Y			Top soil was stored at special sites before it was used for rehabilitation of disturbed lands, strengthening/protection of slopes, road shoulders, quarries, etc.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Earthworks (ctd)					
56. Such materials shall be spread in such a manner as to limit subsequent erosion and shall be vegetated as existing ground cover dictates	56.1 Materials spread so as to limit subsequent erosion	Y			Further rehabilitation of lands is planned after completion of work or when necessary.
	56.2 Spread materials revegetated with locally occurring groundcover species	Y			Further rehabilitation of lands is planned at works completion or when necessary.
Preservation of Antiquities					
57. Contractor shall take all necessary measures to protect any antiquities or archaeological finds as required by item 4.24 of Conditions of Contract	57.1 All Necessary measures taken			N	No antiquities or archaeological finds were identified along the reconstruction section of the road .
58. Where antiquities are shown on the drawings or otherwise identified during the course of the Works, and protected by means of suitable fencing and barriers to the satisfaction of the Engineer.	58.1 Identified antiquities protected by means of suitable fencing and barriers to satisfaction of the Engineer			N	Not required - See item 57.1.
59. The Contractor shall provide and maintain access at all times for persons wishing to stop and pay their respects	59.1 Access maintained as required			N	Not required - See item 57.1.
Environmental Enhancement					
60. On completion of the Works the Contractor shall reinstate all areas with natural vegetation to the satisfaction of the Engineer	60.1 Site Rehabilitation Plan prepared to the satisfaction of the Engineer	Y			Sire rehabilitation plans(SRP) have been approved by Engineer and Ecology Department of Oblast
	60.2 Areas reinstated with natural revegetation in accordance with SRP	Y			In accordance with approved SRP.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Environmental Enhancement (ctd)					
61. The Contractor shall remove all old tyres and internal tubes from within the Limits of Site, and subject to the agreement of adjacent landholders, from an additional area 75m either side of the road centre line	61.1 All old tyres and internal tubes removed from within Limits of Site	Y			Local workers engaged to remove old tyres and inner tubes and other construction debris
	61.2 Landholder agreement obtained for removal of tyres within 75 m of either side of centreline	Y			Agreements obtained and local workers engaged as per item 61.1
	61.3 Tyres removed in accordance with landholder agreements	Y			See above
62. Contractor shall dispose of all materials in a manner approved by the Engineer	62.1 Materials disposed of as approved by Engineer	Y			Removed by SCE "Enterprise for Housing Utilities Akimat Korday Area" No. 01 from 16/01/2012 and in accordance Engineer approval
63. When directed by the Engineer, the Contractor shall improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils regrading to natural ground levels, and re-establishing the natural vegetation.	63.1 Directive relating to land reinstatement received from Engineer	Y			See above
	63.2 Debris removed and land reinstated as directed by Engineer in accordance with SRP (see above)	Y			See above
64. All debris and contaminated materials shall be disposed off site as approved by the Engineer.	64.1 Disposal as approved by Engineer	Y			See above

Contract 002 – Kazakhdorstroy – July to October 2012

TS 106Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
General					
1 Contractor shall provide Environmental Mitigation and Monitoring Plan (CEMMP) in connection the submission of the Program based in the TS	1.1 Plan provided	Y			EMP and program based on technical specification were approved by Engineer (ref Kaz/067/2010) dated May 30, 2010. CCEMMP edited according Engineer's recommendations and provided n first six monthly report for 2010. On January 27, 2011, Senior Environmental Specialist (SES) Peter Hatton of SMEC recommended changes for RevA of the CCEMMP. Document was amended accordingly and approved by Engineer on 18March 2011. CCEMMP was further revised following environmental audit by SES and approved by Engineer February 2012
2 Contractor shall nominate a senior staff person to be responsible for follow-up of implementation of CEMMP and for guidance of Contractor staff and reporting to Engineer	2.1 Person appointed	Y			Environmental Engineer – Y.A. Potapenko resigned voluntarily (order no. 818 dated July 2, 2012). She was replaced in the role by Mr Kim, Head of Coordination Department..
	2.2 Guidance provided to Contractor staff	Y			Induction course was conducted for personnel on site. List of participants was provided in first six months of 2010 report. Instruction course with subcontractors was conducted in June 2011. See list of participants in Appendix 1 of first six months of 2011 report. Managerial staff conducts daily meetings at 7:00 am with own and sub-contractor staff discussing environmental requirements. General office weekly meeting conducted with discussion of environmental issues related to road construction. Environmental engineer visits construction sites and monitors compliance with CCEMMP requirements, issuing directions certificate. Duringthe second half of 2011induction training was conducted for hired personnel. Instruction course was provided for all staff in May 2012.
	2.3 Reports prepared for Engineer	Y			Environmental monitoring reports are prepared and submitted to Engineer monthly
3 CEMMP shall be provided as part of the method statement	3.1 CEMMP provided with method statement	Y			CEMMP is part of the Method Statement
Siting of Camps, Asphalt Plants, Cement Plants and Related Facilities					
4 Siting construction and environmental restoration of facilities for housing construction staff, storage of equipment & vehicles, labour camps, asphalt plants and similar facilities must be planned to the satisfaction of the Engineer	4.1 Plans submitted to Engineer	Y			Location plans (plot plans) for camp site, concrete batching plant, sand washing plant, crushing and screening plant «Sandvik» provided in report for second six months of 2010
	4.2 Engineer indicates he is satisfied	Y			Camp, concrete batching plant, washing unit site and crushing and screening unit location approved by Engineer (letter SMEC ref. № Kaz/003/2011 dated February 14, 2011 attached to report for first six months of 2011 in Appendix 2).

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Pre-Construction Air Quality Monitoring					
5 CEMMP shall specify proposed pre-construction monitoring to verify baseline conditions as advised by Engineer	5.1 Pre-construction AQ monitoring included in CEMMP	Y			Baseline air quality monitoring conducted. Records of air analysis were provided in first six months report for 2010.
	5.2 Site advice provided by Engineer			N	There were no recommendations
6 Pre-construction TSP monitoring at not less than 2 points depending on proposed location of pollution sources	6.1 Monitoring points identified	Y			Baseline data measurements were taken at concrete batching plant, road construction site section km 404- km 443 and in camp. Results were provided in first six months report for 2010.
	6.2 Additional baseline monitoring required by Engineer			N	Additional baseline monitoring was not requested by Engineer
7 CEMMP shall specify locations and frequency of routine instrumented monitoring of AQ	7.1 Locations specified	Y			Air quality monitoring conducted at location of potential pollution sources, CBP, crushed stone plant, crushing and screening plant Sandvik, sand washing plant, cement silos, also in 3 additional sensitive locations:Algabas and Maldybay villages, petrol station Tulparat least once a month. Air quality monitoring at Concrete Batching Plant, Crushing and Screening Plant Sandvik, Sand Washing Unit, cement silos is conducted for Joint Venture company Kazakhdorstroy - Hyundai LLP, because these facilities are rented by this company.
8 AQ monitoring required not less than once per month	8.1 AQ monitoring frequency monthly	Y			Air quality monitoring conducted at agreed locations on a monthly basis. Records of air analysis and comparative analysis for the period from July to December 2011 provided in Appendix 2 and in Appendix 3 accordingly.
9 Additional event-related monitoring may be required by Engineer	9.1 Additional monitoring required	Y			Additional monitoring was required by ADB Environmental Protection Department Specialist (Your ref. № АКМ/014/2011, Каз/033/2011, КСС/035/2011 dated June 16, 2011 – Appendix 5).
10 Monitoring undertaken by third party organizations acceptable to Engineer	10.1 Engineer's acceptance received	Y			Monitoring was undertaken by accredited testing laboratory ZO of KESO Otan LLP in accordance with Contract №66 for environmental monitoring dated 05.03.2012. (Appendix 20 in report for the first half of 2012)
11 Following AQ provisions apply to AMP					
a Open burning prohibited	a Prohibition implemented	Y			Open burning wasnot undertaken
b Solvents & materials used to Engineer's satisfaction	b Material use satisfactory	Y			Engineer's approval for required solutions and materials issued to Company test laboratory of Kazakhdorstroy LLP ZO
c Blasting limited to small charges	c Blasting complies			Y	Blasting works were not required

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
11 Following AQ provisions apply to AMP (ctd)					
d Dust generating items conveyed under cover	d Requirement implemented	Y			Stored dust generating materials were not covered because stockpiles were located at least 2 km from any settlements and had no impact on the environment of local communities. Location of storage areas approved by Engineer (letter of SMEC ref. № Kaz/003/2011 dated February 14, 2011 attached to first six months of 2011 report – Appendix 2). Appendix 6 - letter-approval of Engineer, ref. № Kaz/080/2011 dated November 3, 2011.)
e Road surfaces, excavations & construction sites water sprayed for dust	e Dust controlled by spraying	Y			The road, construction sites, and industrial sites were sprinkled with water in order to suppress dust
f Trucks transporting earth, sand or stones are to be covered with tarpaulins to prevent scattering.	F Trucks covered with tarpaulin	Y			Trucks were covered with tarpaulins whentransporting aggregate materials. The requirement was included in the induction courses for on-site staff and sub-contractor staff and personnel on-site. The requirements were enforced by the Environmental Engineer. Any non-compliance was penalized by not permitting any further haulage by the sub-contractor until acceptable tarpaulins were provided and correctly utilised. Requirements were managed by contractor environmentalist visiting sites and recording violations. Any violation of environmental requirements by sub-contractor staff were reported to senior management in writing by the Environmental Engineer. (Reply to the Engineer letter-confirmation, ref. № Kaz/080/2011 dated November 03, 2011 - Item 4)
Water Quality Monitoring					
12 CEMMP shall include pre-construction monitoring to verify baseline conditions at locations as advised by Engineer	12.1 Pre-construction monitoring included in CEMMP			N	There were no surface or groundwater resources in the vicinity of the project. The construction works therefore had no impacts on groundwater or surface water quality
	12.2 Site advice provided by Engineer			N	There were no recommendations
13 Pre-construction WQ monitoring to include suspended solids (SS), biological oxygen demand (BOD) and dissolved oxygen (DO), conductivity, faecal coliforms and oil & grease	13.1 Required parameters included in pre-construction WQ monitoring			N	Baseline monitoring of water quality was not undertaken (ref Item 12.1)

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Water Quality Monitoring (Ctd)					
14 Additional baseline monitoring may be required by location of major sources of potential water pollution (construction camps & other sources of significant run-off & liquid waste generation)	14.1 Additional baseline monitoring undertaken			N	Additional monitoring of water quality was not requested. Household waste waters were accumulated in sealedcesspit. Accumulated waste waters were transported with special trucks to treatment facilities in accordance with the agreement for removal of waste waters № 93 with SME Kulan-Tazalyk dated from 01/02/2012 to 31/12/2012 is attached to first six months of 2012 report, Appendix 9).
15 Plan shall specify procedures for routine instrumented monitoring of WQ & run-off from construction camps, staging areas & labour camps, at least 1 time per month	15.1 Procedures specified in CEMMP			N	See Items 14 and 14.1
16 Monitoring to include SS, BOD, and DO, conductivity, faecal coliforms, oil & grease.	16.1 Monitoring includes required parameters	Y			Waste water quality monitoring at sand washing plant measures the following indicators: pH, SS, BOD, COD, chlorides, sulfates, petrochemicals. Water quality monitoring conducted once a month.
17 Additional event-related monitoring may be requested by Engineer	17.1 Add. event-related monitoring requested by Engineer			N	Additional monitoring was not requested by Engineer
18 Monitoring undertaken by third party organisations acceptable to Engineer	18.1 Engineer acceptance received	Y			Monitoring was conducted by accredited laboratory of ZO of KESSO Otan LLP, approved by Engineer (ref. 10.1)
Noise and Vibration Monitoring					
19 Pre-construction baseline monitoring of noise and vibration required at minimum of 2 sites including major settlements	19.1 Pre-construction monitoring undertaken	Y			Pre-construction monitoring of noise and vibration was undertaken. Results were attached to first six month of 2010 report.
20 Additional baseline monitoring may be required by Engineer	20.1 Additional monitoring required by Engineer			N	Additional monitoring was not requested

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Noise and Vibration Monitoring (ctd)					
21 Routine instrumented required at minimum 2 locations including baseline monitoring sites	21.1 Routine monitoring undertaken	Y			Noise and vibrations monitoring was conducted on a monthly basis at CBP sanitary and protection zone, crushing and screening plant "Sandvik", at crusher and screening plant locations. Results of noise and vibration and comparative analysis for July November 2011 attached in Appendix 12 and 13 accordingly.
22 Monitoring required at least 1 time per month	22.1 Monitoring frequency as required	Y			Monitoring was undertaken monthly. Records of noise and vibration levels measures and comparative analyses provided in Appendix 14 (pictures 1-5). Maximum acceptable level of noise is 75 dB(A). Results confirm no noise level exceedences during the reporting period.
23 Additional monitoring may be required during pile driving and blasting and otherwise as requested by Engineer	23.1 Additional monitoring undertaken	Y			Additional monitoring was required by ADB Environmental Protection Department Specialist (Your ref. № АКМ/014/2011, Kaz/033/2011, КСС/035/2011 dated June 16, 2011 – attached in Appendix 5).
24 Monitoring undertaken by third party organisations acceptable to Engineer	24.1 Engineer acceptance received	Y			See Item 10.1
Community Relations					
25 CEMMP shall specify proposed public information programs in advance of construction, notification procedures etc	25.1 Program included in CEMMP	Y			Local communities were notified about forthcoming work through mass media. Progress of on-going works notified by advertisements on TV in «creeping line» and through public consultations held with local population. Notifications were placed in local newspapersTaraz Times № 29 (205) August 2010; Zhambyl Taraz № 24 (1050) June 15, 2011;and Arstan №23 (188) 20.07.2011.
Fuel and Chemical Storage					
26 Fuel & chemical storage shall be sited on impervious base within a bund and secured by fencing	26.1 Impervious bund and fencing provided			N	Road construction machinery filled at petrol stations and also with petrol tankers (agreement for supply with KazMunaiGaz Onymder" JCS and with L.K. Nurpeissov IE Contract № 06/336-2012 dated 01.02.2012 to 31.12.2012 and contract № КДС/Жф/Кпр/11/1 with IE L.K. Nurpeissov dated 10.01.2012 to 31.07.2012 attached in Appendix 14) (Appendix 1 – approval letter of Engineer, ref. № Kaz/080/2011 dated November 3, 2011 attached in report for the second half of 2011.)
27 Storage located away from watercourse and wetlands	27.1 Appropriately located			N	There were no owned fuel storages (Appendix 6 - approval letter of Engineer, ref. № Kaz/080/2011 dated November 3, 2011 – attached to report for the second half of 2011)
28 Bund base and walls impermeable	28.1 Impermeability satisfactory			N	See Items 26.1; 27.1

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Fuel and Chemical Storage (ctd)					
29 Capacity of bunded 110% of the volume of tanks within bund	29.1 Pre-construction monitoring undertaken			N	See Item 26.1
30 Filling and refueling strictly controlled & subject to formal procedures	30.1 Procedures developed and implemented	Y			Filling of vehicles wasundertaken in accordance with safety and environmental requirements. In order to manage any spills storage premises and sites were equipped withsand box with sand and rubble The sill sitewould be sprinkled with sand. Polluted soil removed and stored in separate tanks (barrels) (See Appendix 15 in report for the first half of 2012). Accumulated polluted soil would be removed under agreement with organization, licensed for supply of these services. For fire safety every fuel truck was provided with fire extinguishers.
31 Valves & trigger guns shall be resistant to unauthorised interference and vandalism and be turned off and securely locked when not in use	31.1 Valves and trigger guns comply with requirements	Y			See Item26.1
32 Contents of any tank or drum shall be clearly marked	32.1 Contents clearly marked in Russian language			N	See Item26.1 – no material stored in drums
33 Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses	33.1 Measures implemented			N	See Items 26.1, 12.1 – no watercourses in project area
	33.2 Any contaminated discharges entering drain or water course			N	Ingress of pollutants in water sites was not possible - no surface water in the project area
Water Quality					
34 Contractor shall prevent any interference with supply or abstraction from supply or pollution of water resources including groundwater	34.1 Any interference with supply			N	There were no water resources in the project area so no interference with supply
	34.2 Any pollution of surface or groundwater			N	There are no water resources in the project area, therefore no pollution
35 All water and other liquid waste products arising on sites shall be collected on or off the sites and in a manner that shall not cause nuisance or pollution	35.1 All liquid & other wastes collected	Y			Liquid wastes were accumulated on camp site. According to detailed design liquid household wastes were collected in water resistant cesspits (septic) and removed away as per agreement for disposal of waste waters. (See Item 14)
	35.2 Manner of collection not causing pollution	Y			See Item35.1

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Water Quality (ctd)					
36 Contractor shall not discharge or deposit any matter arising from execution of the Works into any water except with permission of Engineer and regulatory authority	36.1 Requirement implemented			N	See Item35.1
	36.2 If discharges, prior Engineer approval obtained			N	See Item35.1
	36.3 If discharges, prior regulatory authority approval obtained			N	See Item35.1
37 Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept free from any debris and materials arising from the Works	37.1 Stream courses and drains kept free of debris and materials arising from the Works			N	See Item35.1
38 Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution, silting, flooding or erosion as a result of the execution of the Works	38.1 All waterways protected			N	See Item35.1
39 Contractor shall submit details of his temporary drainage system (including all surface channels, sediments traps, washing basins and discharge pits) to the Engineer for approval prior to commencing work on its construction.	39.1 Details submitted to Engineer prior to construction	Y			Water supply and sewage designs for the camp, CBP, crushing and screening plant, sand washing plant were provided in second six months of 2010 report. Sewage systems of above mentioned sites approved by Engineer (letter of SMEC ref. № Kaz/006/2011 dated March 14, 2011 – attached in report for first six months of 2011).

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality					
40 Open burning prohibited	40.1 Specification complied with	Y			There was no open burning
41 Contractor shall utilise effective water sprays during delivery and handling of materials when dust likely to be created and to dampen stored materials during dry and windy weather	41.1 Water sprays utilised	Y			See Item 11 – e.Water spray equipment was used at crushing and screening plant Sandvik. Material was moistened before crushing when unloading in bunker of the plant.
42 Stockpiles of materials shall be sited in sheltered areas or within hoarding, away from sensitive areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material shall be dampened prior to their movement, except where this is contrary to the Specification	42.1 Material stockpiles sited in sheltered areas or within hoarding			N	Storage locations are not fenced because stockpiles were located 2 km or more from settlements. (approval letter of SMEC ref. № Kaz/003/2011 dated February 14, 2011 - – attached in report for first six months of 2011) (Appendix 6 - approval letter of Engineer, ref. № Kaz/080/2011 datedNovember 3, 2011)
	42.2 Stockpiles of friable material covered with clean tarpaulins and sprayed with water	Y			Aggregates material was covered with tarpaulin to prevent dust generation in the process of transportation from storages. (ref. 11 - f)
	42.3 Stockpiles dampened prior to movement			N	Aggregates material was covered with tarpaulin in the process of transportation from storages to prevent dust. (ref. 11 - f). Material was not watered prior to transportation.
43 Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards	43.1 Properly fitting side and tail boards provided	Y			All trucks equipped with side limiters and flaps

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality (Ctd)					
44 Materials having potential to produce dust shall not be loaded to a level higher than the side and tail boards and shall be covered with a clean tarpaulin in good condition. Tarpaulin shall be properly secured and extend at least 300mm over the edges of the side and tail boards	44.1 Loads comply with loading requirement	Y			Complyas required (see item 11 – f)
	44.2 Tarpaulins clean and good condition	Y			Complyas required (see item 11 – f)
	44.3 Tarpaulins secured as per specification	Y			Comply as required (see item 11 – f)
45 In periods of high wind, dust generating operations shall not be permitted within 200m of residential areas having regards to the prevailing direction of the wind	45.1 Operations comply with specification	Y			Comply as required
46 Vehicles and machinery are to be kept in sound condition. If a machine is not in operation engine is to be shutdown.	46.1 Vehicles and machinery are kept in sound condition	Y			Machinery repair works wereundertaken by internal services in the premises of RMZ in repair workshop (rental agreement № КДС/Жф/Арн/ 1/6 with Kulan Repair and Machinery Plant LLP dated form 01.01.2012 to 25.10.2012 attached in Appendix 16). Photographs of repair workshop attached in report for the second half of 2011, Appendix 9
	46.2 Engines turned off when not in use	Y			Comply as required
47 Appropriate measures shall be taken to limit exhaust emissions from construction vehicles emissions from construction vehicles, machinery & plant & contractor shall include details in CEMMP	47.1 Measures taken to limit exhaust emissions from vehicles & plant	Y			Almost all road construction machinery and vehicleswere equipped with exhaust filters emission (ref. Appendix 16).

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality (Ctd)					
48 In residential or other sensitive areas such as nurseries and hospitals etc, advance warning shall be given to potentially affected persons, so that measures can be taken by them before commencement of works	48.1 Details included in CCEMMP	Y			Populations of settlements were provided with timely notification before the start of construction works. (ref. item 25). There were no works in environmentally sensitive areas.
	48.2 Assistance with mitigation measures provided to project affected people (PAP)	Y			Dust suppression works wereundertaken (water sprays, cover with tarpaulin), works were on-going from 8.00 to 18.00.
Noise and Vibration					
49 Contractor shall consider noise as an environmental constraint in the planning and execution of the Works	49.1 Noise considered by Contractor as environmental constraint	Y			Noise level monitoring was conducted monthly
50 Contractor shall use plant and equipment conforming to international standards and directives on noise and vibration emissions	50.1 Plant and equipment conforms with international standards for noise and vibration	Y			Crusher plant (located in Sulu-Tor quarry), concrete batching plant, sand-gravel plant, CSP Sandvik met requirements of international standards (Euro 3). Crushers CH (Hydrocone) with hydraulic controlling, highly durable with noise suppression and high operation indices
51 CEMMP shall include details for abating noise at source as per sub-item 4.18 of Conditions of Contract	51.1 CEMMP includes required details for abating noise at source	Y			There were no defined activities for noise suppression at crusher and screening plant as it was located on the property of quarry owned by “DDA” LLP in 6 km from Kulan village. Workers used PPE for noise protection: earplugs and protection ear muffs
52 Contractor shall take all necessary measures to ensure that the operations of all mechanical equipment and construction processes on and off-site shall not cause unnecessary or excessive noise, taking into account applicable environmental requirements.	52.1 All necessary measures taken	Y			See Items 50.1
	52.2 Noise levels in accordance with applicable environmental requirements	Y			Monitoring results confirmed that noise levels complied with maximum allowable limits (see Appendix 13).

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Noise (Ctd)					
53 The Contractor shall use all necessary measures and maintain all plant and silencing equipment in good condition so as to minimise noise during Works	53.1 All necessary measures taken	Y			See Items 50.1
	53.2 Silencing equipment maintained in good condition	Y			See Items 50.1
54 When operating close to sensitive receptors such as residential, nursery, or medical facilities, the Contractor's hours of working shall be limited to 0800 to 1800	54.1 Construction close to sensitive receptors restricted to 0800 to 1800 timeframe			N	There were no sensitive areas within the project area.
Earthworks					
55 Surplus excavation and topsoil shall wherever possible be used to reinstate borrow pits and quarries or other areas as may be approved by the Engineer	55.1 Surplus excavation and topsoil used to reinstate borrow pits and quarries	Y			Topsoil was stored in specially designed sites before its use for re-cultivation of areas within construction site area, slopes and road shoulders protection, quarries etc. There were pictures attached in Appendix 17 (Picture 1 and 2).
56 Such materials shall be spread in such a manner as to limit subsequent erosion and shall be vegetated as existing ground cover dictates	56.1 Materials spread so as to limit subsequent erosion	Y			Works for rehabilitation of disturbed lands have been completed in accordance with approved site rehabilitation plan.
	56.2 Spread materials revegetated with locally occurring groundcover species	Y			Works for rehabilitation of disturbed lands have been completed in accordance with approved site rehabilitation plan.
Preservation of Antiquities					
57 Contractor shall take all necessary measures to protect any antiquities or archaeological finds as required by item 4.24 of Conditions of Contract	57.1 All Necessary measures taken			N	There were no historical places and archeological discoveries in the area under construction. According to RoK Legislation, relevant agencies must be informedif there are any archeological or historical discoveries

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Preservation of Antiquities (ctd)					
59 The Contractor shall provide and maintain access at all times for persons wishing to stop and pay their respects	59.1 Access maintained as required			N	See Item57.1
Environmental Enhancement					
60 On completion of the Works the Contractor shall reinstate all areas with natural vegetation to the satisfaction of the Engineer	60.1 Site Rehabilitation Plan prepared to the satisfaction of the Engineer	Y			Designs for rehabilitation of areas used for storing of aggregate materials, access roads, industrial sites was prepared, translated, sent to Engineer for approval review. (our ref. № 189 T dated May 10, 2012. ZB of "Kazakhdorstroy" LLP) (See Appendix 17 in report for the first half of 2012) and our ref. № 88 dated July 23, 2012 – Appendix 8.
	60.2 Areas reinstated with natural revegetation in accordance with SRP	Y			Undertaken in accordance with design approved by Engineer.
61 The Contractor shall remove all old tyres and internal tubes from within the Limits of Site, and subject to the agreement of adjacent landholders, from an additional area 75m either side of the road centre line	61.1 All old tyres and internal tubes removed from within Limits of Site	Y			Old tyres were removed from construction sites to storage areas with hard surface and roof, excluding rain and foreign objects. Pictures of old tires storages are attached in Appendix 18 (Picture 1) in report for the second half of 2011.Waste tires Handover certificate № 1 is attached in Appendix 18 of the report for the first half of 2012
	61.2 Landholder agreement obtained for removal of tyres within 75m of either side of centreline	Y			See item 60.2
	61.3 Tyres removed in accordance with landholder agreements	Y			See item 60.2
62 Contractor shall dispose of all materials in a manner approved by the Engineer	62.1 Materials disposed of as approved by Engineer	Y			See item 60.2. Wastes were disposed by trucks as per agreement (agreement № 38 for removal of solid wastes with SA Kulan-Tazalyk dated from 01.02.2012 to 31.12.2012 attached in Appendix 19 – six months of 2012 report.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Environmental Enhancement (ctd)					
63 When directed by the Engineer, the Contractor shall improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils regrading to natural ground levels, and re-establishing the natural vegetation.	63.1 Directive relating to land reinstatement received from Engineer	Y			See item 60.2
	63.2 Debris removed and land reinstated as directed by Engineer in accordance with SRP (see above)	Y			See item 60.2
64 All debris and contaminated materials shall be disposed off site as approved by the Engineer.	64.1 Disposal as approved by Engineer	Y			See item 60.2 (Picture 2 attached in Appendix 18)

Contract 003– KCC

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
General					
1 Contractor shall provide Environmental Mitigation and Monitoring Plan (CEMMP) in connection the submission of the Program based in the TS	1.1 Plan provided	Y			The plan was submitted for approval on July 19, 2010 Ref No.099 document No. 1 - Document No. 2 Ref No.008 of February 8, 2011
2 Contractor shall nominate senior staff person to be responsible for follow-up of implementation of CEMMP and guidance of the Contractor staff and reporting to Engineer	2.1 Person appointed	Y			Mombekov Rustem, Letter of appointment No.32 of July 1, 2010
	2.2 Guidance provided to contractor staff	Y			Extensive training provided to KCC staff and sub-contractors. Example provided by the KCC handbook publication "Environmental Guidelines for Site Employees"
3 CEMMP shall be provided as a part of the method statement	3.1 CEMMP provided with method statement	Y			CEMMP was provided with method statement
Siting of Camps, Asphalt Plants, cement Plants and Related Facilities					
4 Siting construction and environmental restoration of facilities for housing construction staff, storage of equipment & vehicles, labour camps, asphalt plants and similar facilities must be planned to the satisfaction of the Engineer.	4.1 Plans submitted to Engineer	Y			Works approved by permits have been completed.
	4.2 Engineer satisfaction obtained	Y			Activities have been undertaken following Engineer approval
Air Quality Monitoring					
5 CEMMP shall specify proposed pre-construction monitoring to verify baseline conditions as advised by Engineer	5.1 Pre-construction AQ monitoring included in CEMMP	Y			Pre-construction AQ monitoring included in approved CEMMP
	5.2 Site advice provided by Engineer	Y			Air quality monitoring relating to additional sites such as Batching Plant and Crusher in Sarykemer-2 have been included in the CEMMP

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality Monitoring (ctd)					
6 Pre-construction TSP monitoring at not less than 2 points depending on proposed location of pollution sources	6.1 Monitoring points identified	Y			Points were defined and included in the report.
	6.2 Additional baseline monitoring required by Engineer			N	No additional baseline monitoring required.
7 CEMMP shall specify locations and frequency of routine instrumented monitoring of AQ	7.1 Locations specified	Y			Points for sampling werespecified
8 AQ monitoring required not less than once per month	8.1 AQ monitoring frequency monthly	Y			Monitoring was undertaken monthly
9 Additional event-related monitoring may be required by Engineer	9.1 Additional monitoring required	Y			Following field inspections by ADB representatives additional noise and vibration monitoring points were established in road side villages
10 Monitoring undertaken by third party organisations acceptable to Engineer	10.1 Engineer acceptance received	Y			"KESO Otan" LLP Accreditation Certificate No. KZ.I.08.1065
11 Following AQ provisions apply to AMP	11.1				
g. Open burning prohibited	a Prohibition implemented	Y			Staff and contractors were advised of this requirement during project induction training
h. Solvents & materials used to Engineer's satisfaction	b Material use satisfactory	Y			Solvents and materials were used in accordance with Engineer's requirements
i. Blasting limited to small charges	c Blasting complies			N	No blasting on the project
j. Dust generating items conveyed under cover	d Requirement implemented	Y			Trucks were covered with tarpaulins when carrying dust generating materials
k. Road surfaces, excavations & construction sites water sprayed for dust control	e Dust controlled by spraying	Y			Truck mounted water sprays were used for dust control at construction sites, crushing plants and temporary detour roads.
l. Trucks carrying earth, sand or stone covered with tarps to avoid spilling.	f Trucks covered with tarps	Y			See 11.1d above

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Water Quality Monitoring					
12 CEMMP shall include pre-construction monitoring to verify baseline conditions at locations as advised by Engineer	12.1 Pre-construction monitoring included in CEMMP	Y			Results were included in CEMMP.
	12.2 Site advice provided by Engineer			N	No site advice provided by Engineer.
13 Pre-construction WQ monitoring to include suspended solids (SS), biological oxygen demand (BOD) and dissolved oxygen (DO), conductivity, faecal coliforms and oil & grease	13.1 Required parameters included in pre-construction WQ monitoring	Y			Pre-construction water quality monitoring included testing for suspended solids (SS), biological oxygen demand (BOD) and dissolved oxygen (DO), conductivity, faecal coliforms and oil & grease (hydrocarbons)
14 Additional baseline monitoring may be required by location of major sources of potential water pollution (construction camps & other sources of significant run-off & liquid waste generation)	14.1 Additional baseline monitoring undertaken	Y			Monitoring was carried out at Crusher in Sarykemer-2, in compliance with Engineer requirements
15 Plan shall specify procedures for routine instrumented monitoring of WQ & run-off from construction camps, staging areas & labour camps, at least 1 time per month	15.1 Procedures specified in CEMMP	Y			Procedures were included.
16 Monitoring to include SS, BOD, DO, conductivity, faecal coliforms, oil & grease.	16.1 Monitoring includes required parameters	Y			See enclosure No.4
17 Additional event-related monitoring may be requested by Engineer	17.1 Additional event-related monitoring requested by Engineer			N	Engineer did not requested any additional monitoring.
18 Monitoring undertaken by third party organisations acceptable to Engineer	18.1 Engineer acceptance received	Y			See clause 10.1

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Noise and Vibration Monitoring					
19 Pre-construction baseline monitoring of noise and vibration required at minimum of 2 sites including major settlements	19.1 Pre-construction monitoring undertaken	Y			Pre-construction monitoring undertaken as required
20 Additional baseline monitoring may be required by Engineer	20.1 Additional monitoring required by Engineer	Y			Additional monitoring was not required by Engineer
21 Routine instrumented required at minimum 2 locations including baseline monitoring sites	21.1 Routine monitoring undertaken	Y			Monitoring undertaken as required
22 Monitoring required at least 1 time per month	22.1 Monitoring frequency as required	Y			Monitoring undertaken during July, August, September and October. Suspended during November and December because of lack of construction activities.
23 Additional monitoring may be required during pile driving and blasting and otherwise as requested by Engineer	23.1 Additional monitoring undertaken			N	Pile driving and blasting works not part of the KCC construction activities.
24 Monitoring undertaken by third party organisations acceptable to Engineer	24.1 Engineer acceptance received	Y			See clause 10.1
Community Relations					
25 CEMMP shall specify proposed public information programs in advance of construction, notification procedures etc	25.1 Program included in CEMMP	Y			Public information program was developed and implemented
Fuel and Chemical Storage					
26 Fuel & chemical storage shall be sited on impervious base within a bund and secured by fencing	26.1 Impervious bund and fencing provided	Y			Construction machineries wererefueled at the stationary service stations in compliance with contracts and fuel for special machinery was delivered by tank trucks.
27 Storage located away from watercourse and wetlands	27.1 Appropriately located	Y			See clause 26.1

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Fuel and Chemical Storage					
28 Bund base and walls impermeable	28.1 Impermeability satisfactory	Y			See clause 26.1
29 Capacity of bunded 110% of the volume of tanks within bund	29.1 Tanks comply	Y			See clause 26.1
30 Filling and refueling strictly controlled & subject to formal procedures	30.1 Procedures developed and implemented	Y			Each plant item is equipped with buckets and shovels for managing any spills of fuel and lubricants,.
31 Valves & trigger guns shall be resistant to unauthorised interference and vandalism and be turned off and securely locked when not in use	31.1 Valves and trigger guns comply with requirements	Y			See clause 26.1
32 Contents of any tank or drum shall be clearly marked	32.1 Contents clearly marked in Russian language	Y			See clause 26.1
33 Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses	33.1 Measures implemented	Y			See clause 30.1
Water Quality					
34 Contractor shall prevent any interference with supply or abstraction from supply or pollution of water resources including groundwater	34.1 Any interference with supply	Y			No interference with supply or pollution of water resources from construction activities
	34.2 Any pollution of surface or groundwater	Y			No pollution of surface or groundwater resources
35 All water and other liquid waste products arising on sites shall be collected on or off the sites and in a manner that shall not cause nuisance or pollution	35.1 All liquid & other wastes collected	Y			Wastes were collected in waterproof tanks and containers for further pumping out and disposal.
	35.2 Manner of collection not causing pollution	Y			Collection and disposal did not cause any pollution

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Water Quality (ctd)					
36 Contractor shall not discharge or deposit any matter arising from execution of the Works into any water except with permission of Engineer and regulatory authority	36.1 Requirement implemented	Y			No construction wastes discharged into water resources
	36.2 If discharges, prior Engineer approval obtained	Y			Contracts werein place for solid domestic wastes removal and disposal with regulatory service of Baizak region.
	36.3 If discharges, prior regulatory authority approval obtained	Y			Not applicable – no discharges
37 Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept free from any debris and materials arising from the Works	37.1 Stream courses and drains kept free of debris and materials arising from the Works		P		Streams generally kept free but some lapses occured
38 Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution, silting, flooding or erosion as a result of the execution of the Works	38.1 All waterways protected		P		See clause 37.1
39 Contractor shall submit details of his temporary drainage system (including all surface channels, sediments traps, washing basins and discharge pits) to the Engineer for approval prior to commencing work on its construction.	39.1 Details submitted to Engineer prior to construction	Y			Details were submitted to Engineer and approved

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality					
40 Open burning prohibited	40.1 Specification complied with	Y			See clause 11.1a.
41 Contractor shall utilise effective water sprays during delivery and handling of materials when dust likely to be created and to dampen stored materials during dry and windy weather	41.1 Water sprays utilised	Y			See clause 11.1d,f
42 Stockpiles of materials shall be sited in sheltered areas or within hoarding, away from sensitive areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material shall be dampened prior to their movement, except where this is contrary to the Specification	42.1 Material stockpiles sited in sheltered areas or within hoarding	Y			Dust is controlled by water sprays
	42.2 Stockpiles of friable material covered with clean tarpaulins and sprayed with water	Y			See clause 42.1
	42.3 Stockpiles dampened prior to movement	Y			See clause 42.1
43 Any vehicle with an open load-carrying area used for transporting potentially dust producing material shall have properly fitting side and tail boards	43.1 Properly fitting side and tail boards provided	Y			Transport trucks fitted with properly fitted side and tail boards.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality					
44 Materials having potential to produce dust shall not be loaded to a level higher than the side and tail boards and shall be covered with a clean tarpaulin in good condition. Tarpaulin shall be properly secured and extend at least 300mm over the edges of the side and tail boards	44.1 Loads comply with loading requirement	Y			Loads comply
	44.2 Tarpaulins clean and good condition		P		Some sub-contractors use other complying material.
	44.3 Tarpaulins secured as per specification	Y			Comply
45 In periods of high wind, dust generating operations shall not be permitted within 200m of residential areas having regards to the prevailing direction of the wind	45.1 Operations comply with specification	Y			During high wind the works near residential areas were suspended
46 Construction vehicles & machinery shall be kept in good working order and engines turned off when not in use	46.1 Vehicles & machinery kept in good working order	Y			Contractor and sub-contractor used new machinery.
	46.2 Engines turned off when not in use	Y			Engines were turned off in the places of unloading and loading, as well as on the construction site during waiting or idle period.
47 Appropriate measures shall be taken to limit exhaust emissions from construction vehicles emissions from construction vehicles, machinery & plant & contractor shall include details in CEMMP	47.1 Measures taken to limit exhaust emissions from vehicles & plant	Y			See clause 46.1

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Air Quality					
48 In residential or other sensitive areas such as nurseries and hospitals etc, advance warning shall be given to potentially affected persons, so that measures can be taken by them before commencement of works	48.1 Details included in CEMMP	Y			Details included
	48.2 Assistance with mitigation measures provided to project affected people (PAP)	Y			See clauses 46 and 47.
Noise and Vibration					
49 Contractor shall consider noise as an environmental constraint in the planning and execution of the Works	49.1 Noise considered by Contractor as environmental constraint	Y			Noise was considered as an environmental constraint. See following clauses
50 Contractor shall use plant and equipment conforming to international standards and directives on noise and vibration emissions	50.1 Plant and equipment conforms with international standards for noise and vibration	Y			Contractor used equipment confirming with standards
51 CEMMP shall include details for abating noise at source as per sub-item 4.18 of Conditions of Contract	51.1 CEMMP includes required details for abating noise at source	Y			Details included
52 Contractor shall take all necessary measures to ensure that the operations of all mechanical equipment and construction processes on and off-site shall not cause unnecessary or excessive noise, taking into account applicable environmental requirements.	52.1 All necessary measures taken	Y			See clause 50.1
	52.2 Noise levels in accordance with applicable environmental requirements	Y			See the monthly monitoring

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Noise and Vibration (ctd)					
53 The Contractor shall use all necessary measures and maintain all plant and silencing equipment in good condition so as to minimise noise during Works	53.1 All necessary measures taken	Y			See clause 50.1
	53.2 Silencing equipment maintained in good condition	Y			See clause 50.1
54 When operating close to sensitive receptors such as residential, nursery, or medical facilities, the Contractor's hours of working shall be limited to 0800 to 1800	54.1 Construction close to sensitive receptors restricted to 0800 to 1800 timeframe	Y			No construction activities were located near nurseries and schools
Earthworks					
55 Surplus excavation and topsoil shall wherever possible be used to reinstate borrow pits and quarries or other areas as may be approved by the Engineer	55.1 Surplus excavation and topsoil used to reinstate borrow pits and quarries	Y			Quarries have been reinstated in concordance with project rehabilitation plant.
56 Such materials shall be spread in such a manner as to limit subsequent erosion and shall be vegetated as existing ground cover dictates	56.1 Materials spread so as to limit subsequent erosion	Y			See clause 55
	56.2 Spread materials revegetated with locally occurring groundcover species	Y			See clause 55
Preservation of Antiquities					
57 Contractor shall take all necessary measures to protect any antiquities or archaeological finds as required by item 4.24 of Conditions of Contract	57.1 All Necessary measures taken			N	No archaeological finds were identified.

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Preservation of Antiquities (ctd)					
58 Where antiquities are shown on the drawings or otherwise identified during the course of the Works, and protected by means of suitable fencing and barriers to the satisfaction of the Engineer.	58.1 Identified antiquities protected by means of suitable fencing and barriers to satisfaction of the Engineer			N	See clause 57
59 The Contractor shall provide and maintain access at all times for persons wishing to stop and pay their respects	59.1 Access maintained as required			N	See clause 57 Access not required
Environmental Enhancement					
60 On completion of the Works the Contractor shall reinstate all areas with natural vegetation to the satisfaction of the Engineer	60.1 Site Rehabilitation Plan prepared to the satisfaction of the Engineer	Y			Draft SRP was prepared and submitted to required government agencies. Plan was submitted to Engineer when confirmed with agencies
	60.2 Areas reinstated with natural revegetation in accordance with SRP	Y			Was progressively implemented as construction works were completed
61 The Contractor shall remove all old tyres and internal tubes from within the Limits of Site, and subject to the agreement of adjacent landholders, from an additional area 75m either side of the road centre line	61.1 All old tyres and internal tubes removed from within Limits of Site	Y			Was progressively implemented as construction works were completed
	61.2 Landholder agreement obtained for removal of tyres within 75m of either side of centreline	Y			See clause 61.1
	61.3 Tyres removed in accordance with landholder agreements	Y			Was progressively implemented as construction works were completed
62 Contractor shall dispose of all materials in a manner approved by the Engineer	62.1 Materials disposed of as approved by Engineer	Y			Was progressively implemented as construction works were completed

TS 106 Requirement	Implementation Activity	Implementation			Comment / Verification / Proposed Action
		Y	P	N	
Environmental Enhancement (ctd)					
63 When directed by the Engineer, the Contractor shall improve and reinstate the land on which informal roadside service areas have been established by removing all debris and contaminated soils regrading to natural ground levels, and re-establishing the natural vegetation	63.1 Directive relating to land reinstatement received from Engineer	Y			Was progressively implemented as construction works were completed
	63.2 Debris removed and land reinstated as directed by Engineer in accordance with SRP (see above)	Y			Was progressively implemented as construction works were completed
64 All debris and contaminated materials shall be disposed off site as approved by the Engineer.	64.1 Disposal as approved by Engineer	Y			Was progressively implemented as construction works were completed

AppendixD

Summary Monthly Air Quality Monitoring Results

July to December 2012 - Contract 001– AKM

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
1	Asphalt plant South-east	NO_2	0.085 mg/m^3	0.0001	0.022	0.028	0.028	0.028	No construction activities – no monitoring	
				0.0001	0.024	0.024	0.024	0.024		
				0.0001	0.023	0.026	0.026	0.026		
		SO_2	0.5 mg/m^3	0.00125	0.44	0.47	0.47	0.47		
				0.00133	0.46	0.45	0.45	0.45		
				0.00135	0.45	0.46	0.46	0.46		
		CO	5 mg/m^3	0.000	3.75	3.71	3.71	3.71		
				0.000	3.76	3.74	3.74	3.74		
				0.000	3.74	3.75	3.75	3.75		
		dust	0.5 mg/m^3	0.0512	0.33	0.31	0.31	0.31		
				0.0511	0.34	0.34	0.34	0.34		
				0.0517	0.32	0.32	0.32	0.32		
2	The sitecrushing plantin the south-east	NO_2	0.085 mg/m^3	0.000	0.046	0.047	0.047	0.047		
				0.000	0.048	0.049	0.049	0.049		
				0.000	0.047	0.048	0.048	0.048		
		SO_2	0.5 mg/m^3	0.000	0.04	0.02	0.02	0.02		
				0.000	0.03	0.01	0.01	0.01		
				0.000	0.02	0.02	0.02	0.02		
		CO	5 mg/m^3	0.000048	2.41	2.14	2.14	2.14		
				0.000047	2.43	2.39	2.39	2.39		
				0.000044	2.42	2.40	2.40	2.40		
		dust	0.5 mg/m^3	0.000	0.27	0.25	0.25	0.25		
				0.000	0.26	0.27	0.27	0.27		
				0.000	0.25	0.25	0.25	0.25		

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
3	The site ABP from the north-west	NO_2	0.085 mg/m^3	0.00125	0.025	0.002	0.002	0.002	No construction activities – no monitoring	
				0.00133	0.027	0.001	0.001	0.001		
				0.00135	0.026	0.001	0.001	0.001		
		SO_2	0.5 mg/m^3	0.000	0.15	0.18	0.18	0.18		
				0.000	0.17	0.17	0.17	0.17		
				0.000	0.16	0.19	0.19	0.19		
		CO	5 mg/m^3	0.0512	3.57	3.53	3.53	3.53		
				0.0511	3.55	3.55	3.55	3.55		
				0.0517	3.56	3.54	3.54	3.54		
		dust	0.5 mg/m^3	0.000	0.1	0.1	0.1	0.1		
				0.000	0.3	0.3	0.3	0.3		
				0.000	0.2	0.2	0.2	0.2		
4	CP platformfrom the north-west	NO_2	0.085 mg/m^3	0.000	0.018	0.014	0.014	0.014		
				0.000	0.016	0.013	0.013	0.013		
				0.000	0.017	0.012	0.012	0.012		
		SO_2	0.5 mg/m^3	0.000048	0.05	0.05	0.05	0.05		
				0.000047	0.07	0.07	0.07	0.07		
				0.000044	0.06	0.06	0.06	0.06		
		CO	5 mg/m^3	0.000	3.2	3.2	3.2	3.2		
				0.000	3.3	3.3	3.3	3.3		
				0.000	3.1	3.1	3.1	3.1		
		dust	0.5 mg/m^3	0.00125	0.03	0.04	0.04	0.04		
				0.00133	0.02	0.02	0.02	0.02		
				0.00135	0.01	0.03	0.03	0.03		

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
5	Kalguty Quarry SGM	NO_2	0.085 mg/m^3	0.000	0.006	0.006	0.006	0.006	No construction activities – no monitoring	
				0.000	0.004	0.004	0.004	0.004		
				0.000	0.005	0.005	0.005	0.005		
		SO_2	0.5 mg/m^3	0.0512	0.02	0.02	0.02	0.02		
				0.0511	0.04	0.04	0.04	0.04		
				0.0517	0.03	0.03	0.03	0.03		
		CO	5 mg/m^3	0.000	2.9	2.6	2.6	2.6		
				0.000	2.7	2.5	2.5	2.5		
				0.000	2.8	2.6	2.6	2.6		
		dust	0.5 mg/m^3	0.000	0.23	0.24	0.24	0.24		
				0.000	0.21	0.27	0.27	0.27		
				0.000	0.22	0.25	0.25	0.25		
6	Side of Road Km 253+600	NO_2	0.085 mg/m^3	0.000	0.006	Not monitored	Not monitored	Not monitored		
				0.000	0.004					
				0.000	0.005					
		SO_2	0.5 mg/m^3	0.0512	0.02					
				0.0511	0.04					
				0.0517	0.03					
		CO	5 mg/m^3	0.000	2.9					
				0.000	2.7					
				0.000	2.8					
		dust	0.5 mg/m^3	0.000	0.23					
				0.000	0.21					
				0.000	0.22					

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
7	Side of Road Km 254+020	NO_2	0.085 mg/m^3	0.0512	0.042	Not monitored	Not monitored	Not monitored	No construction activities – no monitoring	
				0.0511	0.045					
				0.0517	0.039					
		SO_2	0.5 mg/m^3	0.000	0.04					
				0.000	0.07					
				0.000	0.05					
		CO	5 mg/m^3	0.000	3.34					
				0.000	3.32					
				0.000	3.30					
		dust	0.5 mg/m^3	0.000048	0.322					
				0.000047	0.323					
				0.000044	0.321					
8	Side of Road Km 247+320	NO_2	0.085 mg/m^3	0.000	0.33	Not monitored	Not monitored	Not monitored		
				0.000	0.31					
				0.000	0.32					
		SO_2	0.5 mg/m^3	0.00125	0.062					
				0.00133	0.061					
				0.00135	0.062					
		CO	5 mg/m^3	0.000	4.59					
				0.000	4.62					
				0.000	4.65					
		dust	0.5 mg/m^3	0.0512	0.439					
				0.0511	0.442					
				0.0517	0.437					

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
9	Site of road km 233+750	NO_2	0.085 mg/m^3	0.000	Not monitored	0.025	Not monitored	Not monitored	No construction activities – no monitoring	
				0.000		0.024				
				0.000		0.024				
		SO_2	0.5 mg/m^3	0.000		0.35				
				0.000		0.36				
				0.000		0.38				
		CO	5 mg/m^3	0.000048		3.54				
				0.000047		3.59				
				0.000044		3.57				
		dust	0.5 mg/m^3	0.000		0.2				
				0.000		0.1				
				0.000		0.2				
10	Site of road km 233+500	NO_2	0.085 mg/m^3	0.00125	Not monitored	0.032	Not monitored	Not monitored		
				0.00133		0.031				
				0.00135		0.033				
		SO_2	0.5 mg/m^3	0.000		0.36				
				0.000		0.31				
				0.000		0.32				
		CO	5 mg/m^3	0.0512		4.58				
				0.0511		4.62				
				0.0517		4.64				
		dust	0.5 mg/m^3	0.000		0.438				
				0.000		0.441				
				0.000		0.439				

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
11	**Site of road km 220+138**	NO_2	0.085 mg/m^3	0.000	Not monitored	0.043	Not monitored	Not monitored	No construction activities – no monitoring	
				0.000		0.045				
				0.000		0.040				
		SO_2	0.5 mg/m^3	0.000048		0.04				
				0.000047		0.07				
				0.000044		0.06				
		CO	5 mg/m^3	0.000		3.32				
				0.000		3.31				
				0.000		3.30				
		Dust	0.5 mg/m^3	0.00125		0.45				
				0.00133		0.46				
				0.00135		0.46				
12	**Site of road km 219+100**	NO_2	0.085 mg/m^3	0.000	Not monitored	Not monitored	0.042	Not monitored		
				0.000			0.045			
				0.000			0.039			
		SO_2	0.5 mg/m^3	0.0512			0.04			
				0.0511			0.07			
				0.0517			0.05			
		CO	5 mg/m^3	0.000			3.34			
				0.000			3.32			
				0.000			3.30			
		dust	0.5 mg/m^3	0.000			0.45			
				0.000			0.47			
				0.000			0.46			

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
13	Site of road km 221+750	NO_2	0.085 mg/m^3	0.000048	Not monitored	Not monitored	0.034	Not monitored	No construction activities – no monitoring	
				0.000047			0.031			
				0.000044			0.032			
		SO_2	0.5 mg/m^3	0.000			0.46			
				0.000			0.41			
				0.000			0.40			
		CO	5 mg/m^3	0.00125			4.57			
				0.00133			4.61			
				0.00135			4.64			
		Dust	0.5 mg/m^3	0.000			0.437			
				0.000			0.442			
				0.000			0.439			
14	Site of road km 234+400	NO_2	0.085 mg/m^3	0.0512	Not monitored	Not monitored	0.025	Not monitored		
				0.0511			0.024			
				0.0517			0.024			
		SO_2	0.5 mg/m^3	0.000			0.35			
				0.000			0.36			
				0.000			0.38			
		CO	5 mg/m^3	0.000			3.54			
				0.000			3.59			
				0.000			3.57			
		dust	0.5 mg/m^3	0.000048			0.2			
				0.000047			0.1			
				0.000044			0.2			

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
15	Site of road km 225+080	NO_2	0.085 mg/m^3	0.0512	Not monitored	Not monitored	0.032	Not monitored	No construction activities – no monitoring	
				0.0511			0.031			
				0.0517			0.033			
		SO_2	0.5 mg/m^3	0.000			0.035			
				0.000			0.034			
				0.000			0.033			
		CO	5 mg/m^3	0.000			4.56			
				0.000			4.62			
				0.000			4.64			
		Dust	0.5 mg/m^3	0.000048			0.438			
				0.000047			0.441			
				0.000044			0.439			
16	**Site of roadkm 243+400**	NO_2	0,085 mg/m³	0,000	Not monitored	Not monitored	0,043	Not monitored		
				0,00125			0,045			
				0,00133			0,040			
		SO_2	0,5 mg/m³	0,00135			0,04			
				0,000			0,07			
				0,000			0,06			
		CO	5 mg/m³	0,000			3,32			
				0,000			3,31			
				0,000			3,30			
		Dust	0,5 mg/m³	0,000			0,45			
				0,000			0,46			
				0,000			0,46			

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
17	Site of road km 215+100	NO_2	0.085 mg/m³	0.00125	Not monitored	Not monitored	Not monitored	0.025	No construction activities – no monitoring	
				0.00133				0.024		
				0.00135				0.024		
		SO_2	0.5 mg/m³	0.000				0.35		
				0.000				0.36		
				0.000				0.38		
		CO	5 mg/m³	0.000				3.54		
				0.000				3.59		
				0.000				3.57		
		Dust	0.5 mg/m³	0.000				0.2		
				0.000				0.1		
				0.000				0.2		
18	Site of road km 217+200	NO_2	0.085 mg/m³	0.00125	Not monitored	Not monitored	Not monitored	0.032		
				0.00133				0.031		
				0.00135				0.033		
		SO_2	0.5 mg/m³	0.000				0.26		
				0.000				0.25		
				0.000				0.27		
		CO	5 mg/m³	0.000				4.53		
				0.000				4.54		
				0.000				4.52		
		Dust	0.5 mg/m³	0.000				0.439		
				0.000				0.441		
				0.000				0.438		

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
19	Site of road km 246+200	NO_2	0.085 mg/m³	0.00125	Not monitored	Not monitored	Not monitored	0.043	No construction activities – no monitoring	
				0.00133				0.045		
				0.00135				0.040		
		SO_2	0.5 mg/m³	0.000				0.04		
				0.000				0.07		
				0.000				0.06		
		CO	5 mg/m³	0.000				3.32		
				0.000				3.31		
				0.000				3.30		
		Dust	0.5 mg/m³	0.000				0.45		
				0.000				0.46		
				0.000				0.46		
20	Site of road km 224+511	NO_2	0.085 mg/m³	0.00125	Not monitored	Not monitored	Not monitored	0.034		
				0.00133				0.031		
				0.00135				0.032		
		SO_2	0.5 mg/m³	0.000				0.36		
				0.000				0.34		
				0.000				0.35		
		CO	5 mg/m³	0.000				4.57		
				0.000				4.61		
				0.000				4.64		
		Dust	0.5 mg/m³	0.000				0.437		
				0.000				0.442		
				0.000				0.439		

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
21	Site of road km 223+100	NO_2	0.085 mg/m³	0.00125	Not monitored	Not monitored	Not monitored	0.045	No construction activities – no monitoring	
				0.00133				0.045		
				0.00135				0.039		
		SO_2	0.5 mg/m³	0.000				0.04		
				0.000				0.07		
				0.000				0.05		
		CO	5 mg/m³	0.000				3.34		
				0.000				3.32		
				0.000				3.30		
		Dust	0.5 mg/m³	0.000				0.45		
				0.000				0.47		
				0.000				0.46		
22	Site of road Production base	NO_2	0.085 mg/m³	0.000	0.042	0.042	0.34	0.34		
				0.000	0.045	0.045	0.31	0.31		
				0.000	0.039	0.039	0.32	0.32		
		SO_2	0.5 mg/m³	0.00125	0.04	0.05	0.061	0.061		
				0.00133	0.07	0.07	0.064	0.064		
				0.00135	0.05	0.06	0.061	0.061		
		CO	5 mg/m³	0.000	3.34	3.30	4.57	4.57		
				0.000	3.32	3.34	4.64	4.64		
				0.000	3.30	3.32	4.61	4.61		
		Dust	0.5 mg/m³	0.000	0.45	0.321	0.437	0.437		
				0.000	0.47	0.324	0.442	0.442		
				0.000	0.46	0.322	0.439	0.439		

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
23	The site of road Village Korday kitchen	NO_2	0.085 mg/m³	0.000	0.33	0.35	0.042	0.042	No construction activities – no monitoring	
				0.000	0.31	0.32	0.045	0.045		
				0.000	0.32	0.35	0.039	0.039		
		SO_2	0.5 mg/m³	0.00125	0.062	0.062	0.04	0.04		
				0.00133	0.061	0.061	0.07	0.07		
				0.00135	0.062	0.062	0.05	0.05		
		CO	5 mg/m³	0.000	4.59	4.59	3.34	3.34		
				0.000	4.62	4.62	3.32	3.32		
				0.000	4.65	4.65	3.30	3.30		
		Dust	0.5 mg/m³	0.000	0.439	0.439	0.44	0.44		
				0.000	0.442	0.442	0.45	0.45		
				0.000	0.437	0.437	0.47	0.47		

July to December 2012 - Contract 002 – Kazakhdorstroy

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
1	**Site No 1** Concrete batching plant Sampling point 1 - Windward	Nitric oxide	0.4	0.00125	0.002	0.008	Monitoring not undertake at this facility because it was rented by JV company Kazakhdorstroy-Hyundai on the basis of rental agreement No. CII-Ap-1-1-1 dated 01/02/2012 and additional agreement No. 3 dated 26/08/2012		Monitoring terminated because road construction activities completed	
				0.00133	0.002	0.009				
				0.00135	0.004	0.009				
		Carbon dioxide	5.0	0.000	0.001	0.022				
				0.000	0.003	0.018				
				0.000	0.002	0.016				
		Mineral dust	0.3	0.000048	0.002	0.014				
				0.000047	0.002	0.016				
				0.000044	0.003	0.014				
2	**Site №1** Concrete Batching Plant Sampling point 2. Leeward	Nitric oxide	0.4	0.0015	0.010	0.103				
				0.0017	0.012	0.106				
				0.0016	0.014	0.103				
		Carbon dioxide	5.0	0.000	0.024	0.234				
				0.000	0.019	0.189				
				0.000	0.014	0.226				
		Mineral dust	0.3	0.000055	0.038	0.125				
				0.000051	0.031	0.132				
				0.000049	0.029	0.128				

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
7	**Site No 2** Crusher plant Sampling point 1 - Windward	Nitrogen dioxide	0.1	0.000	0.002	0.008	0.002	Monitoring terminated because road construction activities completed		
				0.000	0.002	0.006	0.001			
				0.000	0.001	0.006	0.001			
		Nitric Oxide	0.4	0.00125	0.000	0.005	0.000			
				0.00133	0.001	0.006	0.001			
				0.00135	0.000	0.006	0.001			
		Carbon Black	0.2	0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
		Sulphur dioxide	0.5	0.0512	0.001	0.011	0.001			
				0.0511	0.001	0.014	0.000			
				0.0517	0.002	0.016	0.000			
		Carbon dioxide	5.0	0.000	0.001	0.024	0.001			
				0.000	0.001	0.020	0.002			
				0.000	0.001	0.022	0.002			
		Alkanes	1.0	0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
		Mineral Dust	0.3	0.000048	0.002	0.011	0.001			
				0.000047	0.002	0.015	0.002			
				0.000044	0.002	0.016	0.002			

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
8	**Site No 2** Crusher plant Sampling point 2 - Leeward	Nitrogen dioxide	0.1	0.000	0.029	0.055	0.052	Monitoring terminated because road construction activities completed		
				0.000	0.041	0.060	0.027			
				0.000	0.038	0.058	0.044			
		Nitric Oxide	0.4	0.0015	0.015	0.066	0.013			
				0.0017	0.023	0.070	0.025			
				0.0016	0.027	0.068	0.011			
		Carbon Black	0.2	0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
		Sulphur dioxide	0.5	0.011	0.059	0.137	0.015			
				0.013	0.078	0.129	0.024			
				0.015	0.061	0.133	0.031			
		Carbon dioxide	5.0	0.000	0.033	0.243	0.076			
				0.000	0.045	0.236	0.089			
				0.000	0.062	0.240	0.042			
		Alkanes	1.0	0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
				0.000	0.000	0.000	0.000			
		Mineral Dust	0.3	0.000055	0.060	0.267	0.107			
				0.000051	0.076	0.281	0.098			
				0.000049	0.082	0.266	0.084			

No	Sample Location	Indicator	MAC (mg/m3)	Baseline (mg/m3)	Monthly Readings (mg/m3)					
					July	August	September	October	November	December
9	**Site №5** Sand washing plant, Sampling point № 1, windward	Mineral dust	0.3	No baseline monitoring undertaken	0.003	0.005	0.001	0.000	**Monitoring terminated because road construction activities completed**	
					0.002	0.004	0.001	0.001		
					0.002	0.004	0.002	0.000		
10	**Site №5** Sand washing plant, Sampling point № 2, leeward	Mineral dust	0.3	No baseline monitoring undertaken	0.01	0.107	0.012	0.001		
					0.008	0.109	0.007	0.002		
					0.007	0.110	0.009	0.001		
11	**Site № 6** Village Maldybay Sampling point № 1 Windward	Mineral dust	0.3	No baseline monitoring undertaken	0.001	0.025	0.001	0.000		
					0.001	0.030	0.000	0.000		
					0.001	0.028	0.000	0.000		
12	**Site № 6** Village Maldybay Sampling point № 2 Leeward	Mineral dust	0.3	No baseline monitoring undertaken	0.003	0.206	0.001	0.001		
					0.006	0.210	0.004	0.000		
					0.005	0.209	0.003	0.000		
13	**Site № 7** Village Algabas Sampling point № 1 Windward	Mineral dust	0.3	No baseline monitoring undertaken	0.002	0.014	0.001	0.001		
					0.003	0.016	0.000	0.001		
					0.002	0.016	0.000	0.001		
14	**Site № 7** Village Algabas Sampling point № 2 Leeward	Mineral dust	0.3	No baseline monitoring undertaken	0.009	0.185	0.009	0.001		
					0.011	0.176	0.013	0.001		
					0.007	0.180	0.016	0.001		
15	**Site № 8** PS «Tulpar» Sampling point № 1 Windward	Mineral dust	0.3	No baseline monitoring undertaken	0.003	0.005	0.001	0.000		
					0.002	0.004	0.001	0.001		
					0.002	0.004	0.002	0.000		
16	**Site № 8** АЗС "Тулпар"	Mineral dust	0.3	No baseline monitoring	0.01	0.107	0.012	0.001		
					0.008	0.109	0.007	0.002		

	Sampling point № 2 Leeward			undertaken	0.007	0.110	0.009	0.001	

July to December 2012 - Contract 003– KCC

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Km 483 – Control Point 1	Nitrogen dioxide	0.085	0.003	0.011	0.008	0.005	0.001	
			0.004	0.008	0.017	0.006	0.002	
			0.003	0.007	0.011	0.007	0.003	
	Nitrogen oxide	0.4	0.000	0.003	0.003	0.009	0.002	
			0.000	0.001	0.005	0.011	0.002	
			0.000	0.001	0.002	0.011	0.002	
	Soot	0.15		0.000	0.000	0.000	0.000	
				0.000	0.000	0.000	0.000	
				0.000	0.000	0.000	0.000	
	Sulphur dioxide	0.5	0.010	0.002	0.007	0.026	0.003	
			0.010	0.001	0.002	0.015	0.004	
			0.010	0.002	0.001	0.009	0.005	
	Carbon dioxide	5.0	0.000	0.003	0.002	0.098	0.009	
			0.000	0.008	0.006	0.095	0.012	
			0.000	0.004	0.003	0.089	0.012	
	Alkanes	1.0	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Inorganic dust	0.3	0.000	0.015	0.029	0.019	0.003	
			0.000	0.024	0.015	0.013	0.002	
			0.000	0.021	0.022	0.016	0.002	

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Km 483 – Control Point 2	Nitrogen dioxide	0.085	0.004	0.020	0.025	0.022	0.038	
			0.003	0.017	0.022	0.019	0.043	
			0.004	0.019	0.022	0.018	0.052	
	Nitrogen oxide	0.4	0.007	0.113	0.125	0.105	0.113	
			0.008	0.129	0.137	0.112	0.121	
			0.007	0.130	0.142	0.123	0.127	
	Soot	0.15	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Sulphur dioxide	0.5	0.000	0.022	0.027	0.025	0.028	
			0.000	0.024	0.029	0.027	0.035	
			0.000	0.023	0.026	0.024	0.037	
	Carbon dioxide	5.0	0.000	0.000	0.432	0.209	0.212	
			0.000	0.000	0.443	0.214	0.215	
			0.000	0.000	0.454	0.212	0.218	
	Alkanes	1.0	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Inorganic dust	0.3	0.000	0.221	0.232	0.175	0.166	
			0.000	0.225	0.237	0.195	0.178	
			0.000	0.223	0.236	0.163	0.183	

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Km 443 – Control Point 1	Nitrogen dioxide	0.085	0.007	0.010	0.003	0.007	0.008	
			0.008	0.008	0.004	0.009	0.008	
			0.007	0.009	0.004	0.009	0.009	
	Nitrogen oxide	0.4	0.015	0.011	0.003	0.010	0.011	
			0.007	0.009	0.003	0.013	0.014	
			0.007	0.010	0.002	0.010	0.014	
	Soot	0.15	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Sulphur dioxide	0.5	0.000	0.009	0.007	0.007	0.006	
			0.000	0.008	0.007	0.006	0.006	
			0.000	0.009	0.008	0.009	0.007	
	Carbon dioxide	5.0	0.000	0.008	0.001	0.008	0.009	
			0.000	0.009	0.001	0.012	0.011	
			0.000	0.010	0.002	0.009	0.012	
	Alkanes	1.0	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Inorganic dust	0.3	0.003	0.012	0.008	0.013	0.012	
			0.002	0.014	0.007	0.016	0.012	
			0.004	0.014	0.007	0.017	0.014	

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Km 443 – Control Point 2	Nitrogen dioxide	0.085	0.000	0.022	0.022	0.025	0.024	
			0.000	0.023	0.019	0.022	0.027	
			0.000	0.025	0.018	0.022	0.028	
	Nitrogen oxide	0.4	0.000	0.141	0.105	0.125	0.132	
			0.000	0.136	0.112	0.137	0.141	
			0.000	0.138	0.123	0.142	0.157	
	Soot	0.15	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Sulphur dioxide	0.5	0.017	0.025	0.025	0.027	0.026	
			0.017	0.026	0.027	0.029	0.028	
			0.018	0.028	0.024	0.026	0.031	
	Carbon dioxide	5.0	0.000	0.451	0.209	0.432	0.447	
			0.000	0.468	0.204	0.443	0.455	
			0.000	0.480	0.212	0.454	0.462	
	Alkanes	1.0	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Inorganic dust	0.3	0.001	0.225	0.175	0.232	0.234	
			0.002	0.230	0.195	0.237	0.241	
			0.001	0.229	0.163	0.236	0.252	

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.2, gravel sand mixture quarry "Aksholak" km 478, control point No. 1	Nitrogen dioxide	0.085	0.000	0.005	0.004			
			0.000	0.006	0.004			
			0.000	0.006	0.002			
	Nitrogen oxide	0.4	0.001	0.003	0.002			
			0.001	0.002	0.002			
			0.002	0.003	0.003			
	Soot	0.15	0.000	0.008	0.000			
			0.000	0.010	0.000			
			0.000	0.011	0.000			
	Sulphur dioxide	0.5	0.012	0.008	0.007			
			0.013	0.009	0.008			
			0.014	0.009	0.008			
	Carbon dioxide	5.0	0.000	0.000	0.007			
			0.000	0.000	0.009			
			0.000	0.000	0.012			
	Alkanes	1.0	0.000	0.000	0.000			
			0.000	0.000	0.000			
			0.000	0.000	0.000			
	Inorganic dust	0.3	0.001	0.014	0.011			
			0.002	0.012	0.012			
			0.001	0.015	0.012			

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.2, gravel sand mixture quarry "Aksholak" km 478, control point No. 2	Nitrogen dioxide	0.085	0.060	0.008	0.007			
			0.072	0.009	0.007			
			0.063	0.009	0.006			
	Nitrogen oxide	0.4	0.005	0.221	0.178			
			0.003	0.208	0.182			
			0.003	0.211	0.192			
	Soot	0.15	0.000	0.149	0.000			
			0.000	0.147	0.000			
			0.000	0.148	0.000			
	Sulphur dioxide	0.5	0.011	0.024	0.021			
			0.019	0.020	0.023			
			0.018	0.022	0.026			
	Carbon dioxide	5.0	0.000	0.000	0.163			
			0.000	0.000	0.153			
			0.000	0.000	0.166			
	Alkanes	1.0	0.000	0.000	0.000			
			0.000	0.000	0.000			
			0.000	0.000	0.000			
	Inorganic dust	0.3	0.000	0.088	0.066			
			0.000	0.075	0.054			
			0.000	0.080	0.072			

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.4, loam quarry "Bereke" km 463, control point No.1	Nitrogen dioxide	0.085	0.000	0.006		0.002		
			0.000	0.005		0.004		
			0.000	0.005		0.004		
	Nitrogen oxide	0.4	0.000	0.002		0.004		
			0.000	0.002		0.006		
			0.000	0.003		0.007		
	Soot	0.15	0.000	0.000		0.000		
			0.000	0.000		0.000		
			0.000	0.000		0.000		
	Sulphur dioxide	0.5	0.039	0.009		0.007		
			0.045	0.008		0.009		
			0.015	0.008		0.009		
	Carbon dioxide	5.0	0.000	0.014		0.016		
			0.000	0.010		0.015		
			0.000	0.009		0.016		
	Alkanes	1.0	0.000	0.000		0.000		
			0.000	0.000		0.000		
			0.000	0.000		0.000		
	Inorganic dust	0.3	0.001	0.023		0.026		
			0.002	0.025		0.027		
			0.001	0.030		0.031		

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.4, loam quarry "Bereke" km 463, control point No.2	Nitrogen dioxide	0.085	0.004	0.010		0.011		
			0.004	0.014		0.015		
			0.003	0.012		0.016		
	Nitrogen oxide	0.4	0.002	0.113		0.102		
			0.001	0.115		0.097		
			0.002	0.114		0.105		
	Soot	0.15	0.000	0.000		0.000		
			0.000	0.000		0.000		
			0.000	0.000		0.000		
	Sulphur dioxide	0.5	0.016	0.123		0.105		
			0.016	0.118		0.109		
			0.015	0.120		0.112		
	Carbon dioxide	5.0	0.030	0.562		0.098		
			0.015	0.521		0.129		
			0.020	0.532		0.135		
	Alkanes	1.0	0.000	0.000		0.000		
			0.000	0.000		0.000		
			0.000	0.000		0.000		
	Inorganic dust	0.3	0.001	0.221		0.171		
			0.002	0.208		0.154		
			0.001	0.192		0.118		

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.6 Concrete Batching Plant, control point No.1	Nitrogen dioxide	0.085	0.000	0.012	0.021	0.012	0.010	
			0.000	0.009	0.024	0.011	0.012	
			0.000	0.009	0.024	0.009	0.014	
	Nitrogen oxide	0.4	0.000	0.011	0.164	0.011	0.011	
			0.000	0.009	0.172	0.009	0.012	
			0.000	0.010	0.181	0.010	0.014	
	Soot	0.15	0.000	0.008	0.016	0.008	0.000	
			0.000	0.009	0.017	0.009	0.000	
			0.000	0.008	0.019	0.008	0.000	
	Sulphur dioxide	0.5	0.000	0.008	0.000	0.008	0.009	
			0.000	0.011	0.000	0.011	0.011	
			0.000	0.010	0.000	0.010	0.012	
	Carbon dioxide	5.0	0.000	0.000	0.012	0.000	0.007	
			0.000	0.000	0.015	0.000	0.007	
			0.000	0.000	0.011	0.000	0.009	
	Alkanes	1.0	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Inorganic dust	0.3	0.000	0.022	0.123	0.022	0.021	
			0.000	0.028	0.125	0.028	0.023	
			0.000	0.020	0.130	0.020	0.025	

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.6 Concrete Batching Plant, control point No.2	Nitrogen dioxide	0.085	0.000	0.023	0.013	0.022	0.023	
			0.000	0.020	0.013	0.024	0.025	
			0.000	0.021	0.016	0.026	0.028	
	Nitrogen oxide	0.4	0.016	0.112	0.144	0.115	0.125	
			0.017	0.122	0.146	0.124	0.128	
			0.018	0.118	0.142	0.121	0.132	
	Soot	0.15	0.000	0.137	0.000	0.110	0.000	
			0.000	0.139	0.000	0.107	0.000	
			0.000	0.140	0.000	0.092	0.000	
	Sulphur dioxide	0.5	0.011	0.205	0.000	0.168	0.172	
			0.010	0.196	0.000	0.179	0.179	
			0.008	0.200	0.000	0.197	0.185	
	Carbon dioxide	5.0	0.000	0.000	0.010	0.000	0.104	
			0.000	0.000	0.009	0.000	0.111	
			0.000	0.000	0.011	0.000	0.113	
	Alkanes	1.0	0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
			0.000	0.000	0.000	0.000	0.000	
	Inorganic dust	0.3	0.000	0.255	0.023	0.165	0.124	
			0.000	0.263	0.025	0.147	0.127	
			0.000	0.241	0.027	0.152	0.133	

Sampling Location	Parameters	MAC (mg/m3)	Baseline (mg/m3)	Monthly Sampling Results (mg/m3)				Comment
				July	August	September	October	
Air quality sampling from ground No.7 in Aksholak village, control point No.1	Inorganic dust	0.3	0.004	0.217	0.217	0.179	0.017	
			0.003	0.208	0.208	0.192	0.022	
			0.004	0.213	0.213	0.165	0.025	
Air quality sampling from ground No.7 in Aksholak village, control point No.2	Inorganic dust	0.4	0.001	0.025	0.024	0.021	0.167	
			0.002	0.030	0.032	0.019	0.172	
			0.001	0.028	0.027	0.024	0.178	
Air quality sampling from ground No.8 in Akyrtobe village, control point No.1	Inorganic dust	0.15	0.005	0.014	0.015	0.011	0.003	
			0.003	0.016	0.016	0.013	0.005	
			0.003	0.014	0.016	0.014	0.005	

AppendixE

Summary Monthly Water Quality Monitoring Results

July to December 2012 - Contract 001–AKM

Sampling Location	Parameters	MAC (mg/l)	Monthly Monitoring Results				Comment
			July	August	September	October	
Waste Water	TSS	0.42	0.58	0.59	0.59	0.59	
	pH	6-9	8.0	8.1	8	8	
	Calcium (mg/dm3)	61.0	14.1	14.2	14.3	14.3	
	Chlorides (mg/dm3)	350	27.1	27.2	27.2	27.2	
	Ammonia nitrogen (mg/dm3)	5.0	1.0	1.0	1.0	1.0	
	Nitrate nitrogen (mg/dm3)	3.3	1.0	1.0	1.0	1.0	
	Fluorine (mg/dm3)	0.5	0.01	0.01	0.01	0.01	

Sampling Location	Parameters	MAC (mg/l)	Monthly Monitoring Results				Comment
			July	August	September	October	
Shift Town Betkaynar	pH	6-9	7.2	7.2	7.2	7.3	
	Residual ozone (mg/dm3)	5	0.68	0.96	0.92	1.2	
	Oxidation (dm3)	2	0	0	0	0	
	Ammonia nitrogen (mg/dm3)	1.0	0	0	0	0	
	Nitrate nitrogen (mg/dm3)	10	6.7	6.9	6.7	8.1	
	Nitrate nitrogen (mg/dm3)	7 (10)	6.4	6.5	6.7	6.9	
	Total hardness (mol/dm)	1000 (1500)	640.0	640.0	640.0	584.0	
	Dry matter (mg/dm3)	350	22.0	35.4	35.2	42.2	
	Chlorides (mg/dm3)	500	320.0	310.0	320.0	270.0	
	Sulfates (mg/dm3)	0,3	0.02	0.02	0.02	0.02	
	Iron (mg/dm3)	180.0	74.4	74.0	74.0	74.2	
	Calcium (mg/dm3)	61.0	48.4	48.7	48.7	30.5	
	Plumbum (mg/dm3)	1.2	0.02	0.02	0.02	O,02	
	Fluorine (mg/dm3)	1.2	0.02	0.02	0.02	0.02	

July to December 2012 - Contract 002 – Kazakhdorstroy

No	Sampling location,	Indicators	MAC (mg/l)	Monthly Readings (mg/l)			
				August	September	October	November
1	Waste water Sand Washing Plant	pH		6.8	6.7	6.6	8.52
		Suspended particles	3730	30.7	30.5	15.2	15.1
		Oxygen Chemical Consumption	240	168.5	166.7	134.5	134.3
		Biological Oxygen Consumption (BPK-5)	1000	0.3	0.5	0.3	0.4
		Chlorides	75	250	261	548	532
		Sulphates	460	330	329	420	423
		Petroleum products	50	145	148	205	207

July to December 2012 - Contract 003–KCC

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Uchbulak Project Office	Sodium + Potassium	200	88	20.62	20.57	20.55	20.52	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		42	0.61	0.59	0.57	0.55	
	Calcium	180	163	46.0	46.2	45.94	45.92	
	Magnesium	50	49	28.0	28.4	28.38	28.41	
	Copper	1.0	BDL	0.009	0.007	0.006	0.006	
	Zinc	5.0	0.02	0.03	0.03	0.04	0.038	
	Lead	0.03	BDL	BDL	BDL	BDL	BDL	
	Manganese	0.5	0.016	0.001	0.01	0.02	0.0022	
	Arsenic	0.05	BDL	BDL	BDL	BDL	BDL	
	Phosphates	5.0	1.8	1.1	1.1	1.3	1.32	
	Chromium	0.5	0.021	0.005	0.004	0.004	0.003	
	Iron	0.3	0.02	0.03	0.04	0.042	0.039	
	Chlorides	350.0	13.5	33.9	33.5	33.3	33.28	
	Sulphates	500.0	229	66.9	65.1	66.4	66.35	
	Nitrogen ammonium	2.0	BDL	0.59	0.63	0.65	0.71	
	Nitrates	45.0	7.76	15.0	15.1	15.3	15.24	
	Fluorides	1.20	0.35	0.82	0.81	0.79	0.77	
	Hydrocarbons	10.0	BDL	BDL	BDL	BDL	BDL	
	TSS	500.0	BDL	BDL	BDL	BDL	BDL	
	COD	900	16.48	3.0	3.0	3.11	3.22	
	BOD	425	12.55	1.05	1.06	12.55	1.33	
	pH	6.5-8.5	7.8	7.5	7.4	7.8	7.21	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Labour Camp MTS Company	Sodium + Potassium	200	20.56	20.56	20.54	20.51	20.63	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		0.14	0.14	0.15	0.14	0.18	
	Calcium	180	36.0	36.0	36.3	35.8	37.1	
	Magnesium	50	20.78	20.78	20.76	20.69	20.72	
	Copper	1.0	0.01	0.01	0.011	0.012	0.012	
	Zinc	5.0	0.05	0.05	0.04	0.04	0.044	
	Lead	0.03	BDL	BDL	BDL	BDL	BDL	
	Manganese	0.5	0.03	0.03	0.03	0.03	0.03	
	Arsenic	0.05	BDL	BDL	BDL	BDL	BDL	
	Phosphates	5.0	1.5	1.5	1.54	1.53	1.54	
	Chromium	0.5	0.008	0.008	0.007	0.007	0.006	
	Iron	0.3	0.006	0.006	0.006	0.005	0.05	
	Chlorides	350.0	20.2	20.2	20.3	20.4	21.2	
	Sulphates	500.0	171.0	171.0	170.8	170.6	173.5	
	Nitrogen ammonium	2.0	BDL	BDL	BDL	BDL	BDL	
	Nitrates	45.0	5.0	5.0	5.2	5.21	5.37	
	Fluorides	1.20	0.86	0.86	0.85	0.84	0.86	
	Hydrocarbons	10.0	BDL	BDL	BDL	BDL	BDL	
	TSS	500.0	BDL	BDL	BDL	BDL	BDL	
	COD	900	3.2	3.2	3.2	3.3	3.34	
	BOD	425	1.1	1.1	1.12	1.14	1.16	
	pH	6.5-8.5	7.1	7.1	7.2	7.3	7.27	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Talas River Control Pint 1	Sodium + Potassium	200	20.56	No Monitoring during July, August and September. Insufficient water in the Talas River due to diversions for irrigation of vegetable crops			18.34	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		0.14				2.42	
	Calcium	180	36.0				54.17	
	Magnesium	50	20.78				19.64	
	Copper	1.0	0.01				0.0006	
	Zinc	5.0	0.05				0.04	
	Lead	0.03	BDL				BDL	
	Manganese	0.5	0.03				0.003	
	Arsenic	0.05	BDL				BDL	
	Phosphates	5.0	1.5				1.1	
	Chromium	0.5	0.008				0.014	
	Iron	0.3	0.006				0.01	
	Chlorides	350.0	20.2				10.35	
	Sulphates	500.0	171.0				89.1	
	Nitrogen ammonium	2.0	BDL				0.62	
	Nitrates	45.0	5.0				6.44	
	Fluorides	1.20	0.86				0.53	
	Hydrocarbons	10.0	BDL				BDL	
	TSS	500.0	BDL				BDL	
	COD	900	3.2				16.9	
	BOD	425	1.1				9.75	
	pH	6.5-8.5	7.1				6.6	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Talas River Control Pint 2	Sodium + Potassium	200	87.04	No Monitoring during July, August and September. Insufficient water in the Talas River due to diversions for irrigation of vegetable crops			19.74	Monitoring suspended for November and December due to onset of winter conditions and on-set of winter
	Potassium		Not tested				2.37	
	Calcium	180					55.2	
	Magnesium	50					17.48	
	Copper	1.0	0.0006				0.0007	
	Zinc	5.0	Not tested				0.06	
	Lead	0.03					BDL	
	Manganese	0.5					0.006	
	Arsenic	0.05					BDL	
	Phosphates	5.0					1.31	
	Chromium	0.5					0.02	
	Iron	0.3					0.03	
	Chlorides	350.0					12.24	
	Sulphates	500.0	108.6				100.83	
	Nitrogen ammonium	2.0	0.43				0.65	
	Nitrates	45.0	11.0				6.75	
	Fluorides	1.20	0.79				0.52	
	Hydrocarbons	10.0	BDL				BDL	
	TSS	500.0	0.12				BDL	
	COD	900	5.0				17.4	
	BOD	425	1.8				9.82	
	pH	6.5-8.5	6.8				6.4	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Course of Talas River Control Pint 1	Sodium + Potassium	200	66.8	Monitoring suspended due to low water levels in Talas River	18.38	18.11	22.8	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		Not tested		Not tested	2.35	2.46	
	Calcium	180				54.12	56.12	
	Magnesium	50				19.61	17.79	
	Copper	1.0	0.3		0.0006	0.0005	0.0012	
	Zinc	5.0	Not tested		Not tested	0.05	0.06	
	Lead	0.03				BDL	BDL	
	Manganese	0.5				0.04	0.015	
	Arsenic	0.05				BDL	BDL	
	Phosphates	5.0				1.2	2.17	
	Chromium	0.5				0.023	0.00021	
	Iron	0.3				0.012	0.05	
	Chlorides	350.0				10.31	14.7	
	Sulphates	500.0	162.5		89.2	89.3	131.2	
	Nitrogen ammonium	2.0	BDL		BDL	0.59	0.82	
	Nitrates	45.0	14.9		7.35	7.32	12.75	
	Fluorides	1.20	0.42		0.51	0.53	0.53	
	Hydrocarbons	10.0	BDL		Not tested	BDL	BDL	
	TSS	500.0	0.11		BDL	BDL	BDL	
	COD	900	11.1		18.9	18.7	18.2	
	BOD	425	5.0		9.8	9.7	9.91	
	pH	6.5-8.5	7.1		6.7	7.3	6.7	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Course of Talas River Control Pint 2	Sodium + Potassium	200	88.2	Monitoring suspended due to low water levels in Talas River	19.7	19.5	33.3	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		Not tested		Not tested	2.35	2.12	
	Calcium	180				56.22	55.8	
	Magnesium	50				17.54	16.8	
	Copper	1.0	0.6		0.0006	0.0005	0.0015	
	Zinc	5.0	Not tested		Not tested	0.06	0.07	
	Lead	0.03				BDL	BDL	
	Manganese	0.5				0.006	0.025	
	Arsenic	0.05				BDL	BDL	
	Phosphates	5.0				1.43	2.5	
	Chromium	0.5				0.014	0.00021	
	Iron	0.3				0.031	0.04	
	Chlorides	350.0				12.21	12.9	
	Sulphates	500.0	220.2		101.2	100.9	123.4	
	Nitrogen ammonium	2.0	BDL		BDL	0.67	0.77	
	Nitrates	45.0	22.5		6.35	6.36	13.2	
	Fluorides	1.20	1.2		0.51	0.53	0.514	
	Hydrocarbons	10.0	BDL		Not tested	BDL	BDL	
	TSS	500.0	0.35		BDL	BDL	BDL	
	COD	900	140.5		15.4	15.2	25.5	
	BOD	425	77.6		7.7	7.4	13.7	
	pH	6.5-8.5	7.3		6.5	6.4	6.8	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Akyrtobe Village Control Pint 1	Sodium + Potassium	200	86.9	87.04	87.22	87.24	87.3	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		Not tested	Not tested	Not tested	8.45	8.52	
	Calcium	180				50.29	51.11	
	Magnesium	50				31.25	31.47	
	Copper	1.0	0.0006	0.0006	0.0005	0.0005	0.0005	
	Zinc	5.0	Not tested	Not tested	Not tested	0.027	0.061	
	Lead	0.03				BDL	BDL	
	Manganese	0.5				0.006	0.006	
	Arsenic	0.05				BDL	BDL	
	Phosphates	5.0				1.25	1.22	
	Chromium	0.5				0.12	0.011	
	Iron	0.3				0.03	0.03	
	Chlorides	350.0				12.35	12.42	
	Sulphates	500.0	108.6	108.6	107.8	107.7	107.5	
	Nitrogen ammonium	2.0	0.43	0.43	BDL	0.43	0.42	
	Nitrates	45.0	11.0	11.0	11.2	10.9	10.9	
	Fluorides	1.20	0.79	0.79	0.82	0.83	0.81	
	Hydrocarbons	10.0	BDL	BDL	BDL	0.3	0.3L	
	TSS	500.0	0.12	0.12	0.14	0.15	0.14	
	COD	900	5.0	5.0	5.3	5.2	5.14	
	BOD	425	1.8	1.8	1.7	1.7	1.64	
	pH	6.5-8.5	6.8	6.8	6.7	6.6	6.64	

BDL = Below detection levels

Sampling Location	Parameters	MAC (mg/l)	Baseline (mg/l)	Monthly Monitoring Results (mg/l)				Comment
				July	August	September	October	
Akyrtobe Village Control Pint 2	Sodium + Potassium	200	86.9	87.04	87.15	87.14	87.14	Monitoring suspended for November and December due to onset of winter conditions nd on-set of winter
	Potassium		Not tested	Not tested	Not tested	8.49	8.49	
	Calcium	180				51.4	51.4	
	Magnesium	50				31.2	31.2	
	Copper	1.0	0.0006	0.0006	0.0006	0.0005	0.0006	
	Zinc	5.0	Not tested	Not tested	Not tested	0.06	0.06	
	Lead	0.03				BDL	BDL	
	Manganese	0.5				0.005	0.005	
	Arsenic	0.05				BDL	BDL	
	Phosphates	5.0				1.33	1.33	
	Chromium	0.5				0.007	0.007	
	Iron	0.3				0.033	0.033	
	Chlorides	350.0				12.34	12.34	
	Sulphates	500.0	110.3	108.6	108.4	108.2	108.2	
	Nitrogen ammonium	2.0	0.45	0.43	BDL	0.44	0.44	
	Nitrates	45.0	10.62	11.0	10.57	10.55	10.55	
	Fluorides	1.20	0.84	0.79	0.83	0.82	0.82	
	Hydrocarbons	10.0	BDL	BDL	BDL	0.12	0.08	
	TSS	500.0	0.125	0.12	0.134	0.132	0.132	
	COD	900	5.2	5.0	5.2	5.1	5.14	
	BOD	425	1.76	1.8	1.74	1.72	1.72	
	pH	6.5-8.5	6.8	6.8	6.7	6.7	6.7	

BDL = Below detection levels

AppendixF

Summary Monthly Noise Monitoring Results

July to December 2012 - Contract 001–AKM

No	Location	Max Acceptable Level (dBA)	Monthly Monitoring Results (dBA)					
			July	August	September	October	November	December
1	Asphalt plant from south-east	80	72	72	71	77	No monitoring No construction activities	
2	Crushing plant from south-east	80	77	74	76	71		
3	Asphalt plant from north-west	80	79	71	79	72		
4	Crushing plant from north-west	80	71	70	72	70		
5	Kalguty Quarry	80	70	62	61	70		
6	Roadside km 253+600	80	68					
7	Roadside km 254+020	80	65					
8	Roadside km 247+320	80						
9	Roadside km 233+750	80		60				
10	Roadside km 234+500	80		61				
11	Roadside km 220+138	80		62				
12	Roadside km 219+100	80			61			
13	Roadside km 221+750	80			61			
14	Roadside km 234+400	80			65			
15	Roadside km 225+080	80			63			
16	Roadside km 234+500	80			60			
17	Roadside km 215+100	80			60			
18	Roadside km 217+200	80				71		
19	Roadside km 246+200	80				67		
20	Roadside km 224+511	80				65		
21	Roadside km 223+100	80				62		
22	Roadside production base Korday	55	47	51	52	47		
23	Roadside Korday kitchen	55	52	52	52	48		

July to October 2012 - Contract 002 – Kazakhdorstroy

No	Location	Max Acceptable Level (dBA)	Monthly Monitoring Results (dBA)					
			July	August	September	October	November	December
1	Crushing plant	75	42	46	45	47	No monitoring – Construction activities completed	
2			43	48	47	47		
3			43	45	48	46		
1	Algabas Village	75	46	51	43	42		
2			42	49	42	44		
3			42	47	41	42		
1	Maldybay Village	75	42	44	43	42		
2			45	46	42	44		
3			42	45	41	42		
1	Petrol Station Tulpar	75	42	45	43	42		
2			42	44	42	44		
3			41	43	41	42		

July to November 2012 - Contract 003–KCC

No	Location	Max Acceptable Level (dBA)	Monthly Monitoring Results (dBA)					
			July	August	September	October	November	December
1	Aksholak Village Control Point 1	75	43	43	44	441	43	No Monitoring – Construction activities completed
2			45	45	45	42	40	
3			44	44	44	40	43	
1	Aksholak Village Control Point 2	75	44	44	44	43	43	
2			42	42	41	39	41	
3			45	45	40	4o	42	
1	Akyrtobe Village Control Point 1	75	42	42	42	48	45	
2			42	42	41	45	43	
3			40	40	40	43	42	
1	Akyrtobe Village Control Point 2	75	41	41	44	42	42	
2			40	40	41	44	43	
3			41	41	43	44	41	
1	Batching Plant	75	69	68	70	57	No monitoring – plant dismantled	
2			63	63	63	52		
3			68	68	67	59		
1	Sarykemer Crusher	75	53	53	49	45		
2			50	50	49	47		
3			54	54	52	45		

AppendixG

Photographs

G1 - AKM

AKM Site Rehabilitation Activities

AKM dust control by water sprays

AKM – Lack of sediment and erosion control measures adjacent to waterway

Local residents involved in tree felling and clearing for road construction – safety issues with young children on site and no PPE while working under over-head trees

Above – Dust generation by AKM truck.

Right – Dust control on water sprayed road

Below – Dust control by laying milled asphalt on haul road though village

Above – Hazards on the road

Left – Exhaust emission and noise controls on AKM haul truck

G2 - Kazakhdorstroy

Air Quality Monitoring
Above – PS Tulpar
Right – CSP Sandvik
Below – Construction Site

Above – Signs diverting traffic from new carriageway to old highway – contradiction in direction signs

Below – Dust control by water truck at concrete batching plant

Above –Firefighting equipment at batching plant

Left and below – Solid waste storage at CBP

Dust control at gravel crushing plan:

- **Above – watering stockpiles**
- **Below – watering gravel before entering crusher**
- **Right – effectiveness demonstrated by lack of dust from gravel depositing**

Above and below – SGM quarry before rehabilitation

G3 - KCC

KCC Environmental Monitoring

- **Above – Air quality at Aksholak loam quarry**
- **Right – Water quality at Akyrtobe Village**
- **Below – Noise & vibration Sarykemer Quarry**

Above –Sarykemer Quarry in winter

Right – Dust generated by KCC haul truck

Below – Dust control by spray truck watering

Above – KCC survey gang with PPE

Below – Top soil stockpiling