



**Environmental, Health & Safety Due Diligence  
Assessment**

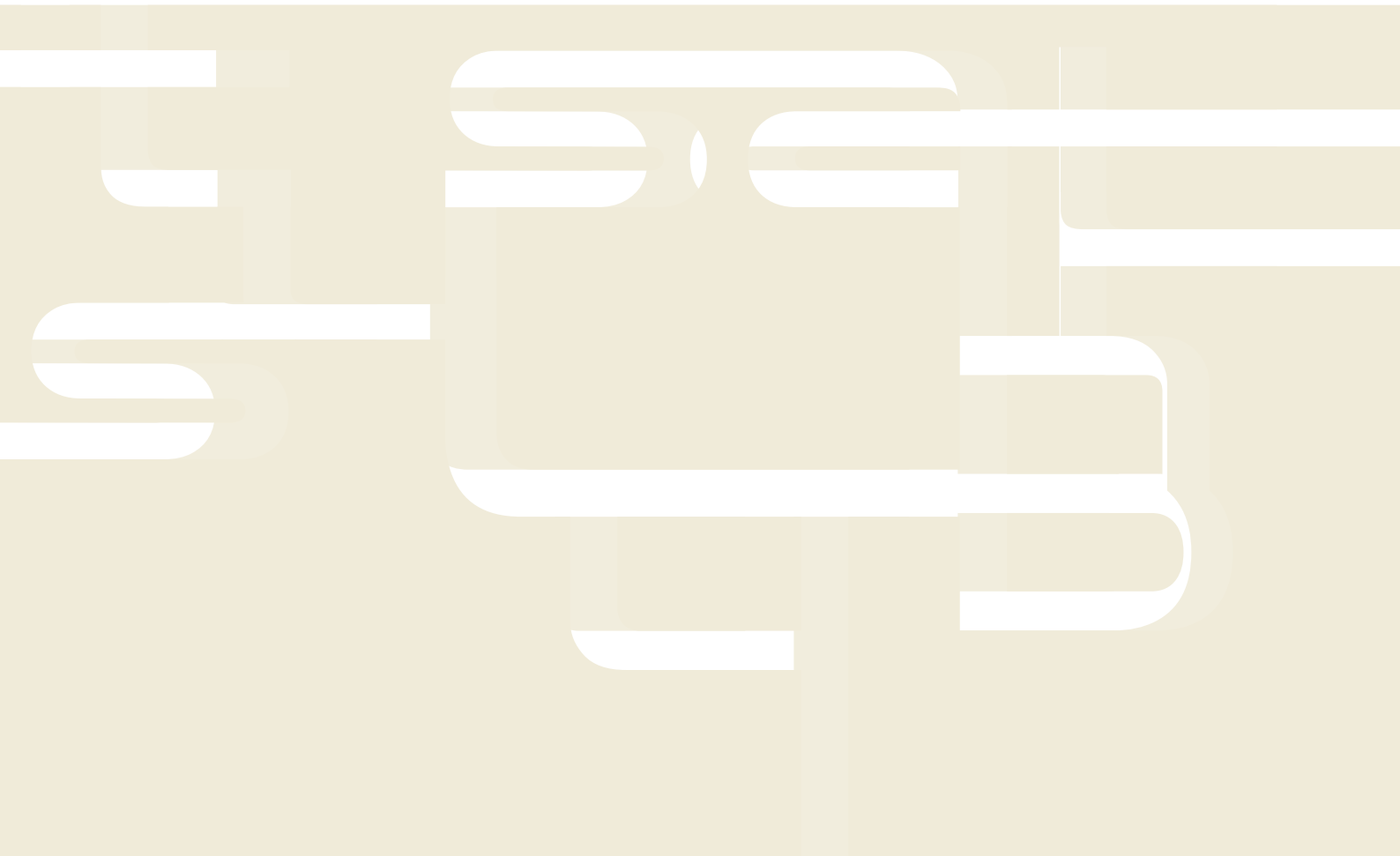
**September, 2007**





**Environmental, Health & Safety Due Diligence  
Assessment**

**September, 2007**



Date – September 2007

Reference – 5879000277

Dear Sirs

**Re: Project Blue Star**

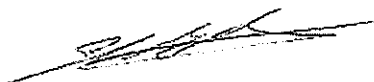
Please find enclosed the environmental due diligence assessment undertaken in relation to the proposed Initial Public Offering of global depository receipts representing partnership interests in ZhaikMunai LP on the London Stock Exchange.

**Principal Author**

Gavin Cuthbert

Date

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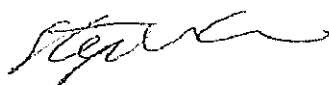
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**Collaborating Authors**

Stephen Gill

Date

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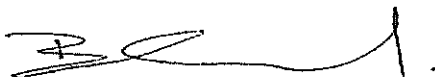
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**Final Review & Authoriser**

Ben Sawford

Date

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**AMEC**

Earth & Environmental UK Ltd.

## Executive Summary

AMEC Earth & Environmental UK Ltd was commissioned by Probel Capital Management to undertake an independent Environmental, Health & Safety Due Diligence Assessment of the ZhaikMunai LP Oil & Gas assets located in the North West region of the Republic of Kazakhstan.

The assessment has been undertaken in connection with a proposed Initial Public Offering (IPO) of the global depository receipts representing partnership interests in ZhaikMunai LP (GDRs) and the admission of the GDRs to the Official List of the UK Listing Authority and to trading on the London Stock Exchange's (LSE) market. Credit Suisse Securities (Europe) Limited and ING Bank N.V. London Branch are acting as joint fund managers in connection with the IPO.

This report has been undertaken in accordance with the requirements of International Standard 14015 - "Environmental Assessment of Sites and Organisations" (ISO 14015) and in part following the requirements of the International Accounting Standard No. 37 (IAS 37), which deals with the assessment of liability and contingent liabilities.

This report has been based on a review of data held at ZhaikMunai LP Head Office in Uralsk, visits to selected operational facilities and discussions with senior ZhaikMunai management.

The following scope of upstream oil and gas operations undertaken within ZhaikMunai LP were considered under this environmental, health & safety due diligence assessment:

- Exploratory drilling activities;
- Production well status;
- Abandoned well status;
- Water well status;
- Oil Treatment Unit;
- Oil Pipeline (under construction);
- Demercaptanization Unit (under construction); and
- Oil Terminal (under initial construction).

At present, oil from the production wells is fed to the central oil treatment unit where gas and oil are separated through a 3-stage heat treatment system. At present the gas is flared and the oil is transported to Uralsk rail terminal via road tankers.

The proposed development of the field will include the demercaptanisation facility which will remove H<sub>2</sub>S and mercaptan sulphur from the oil. Furthermore, an oil pipeline (120 km) to Uralsk is currently under construction to transport the oil, rather than road tanker. This will include an oil terminal at the end of the pipeline in Uralsk.

In addition, a gas treatment facility is proposed to be built next to the oil treatment unit which will produce gas compounds such as pentane and butane and remove sulphur. A gas pipeline is also proposed to transport the gas to Uralsk.

The specific objectives of the assessment were to identify environmental, health and safety compliance and, where possible, quantify:

1. Regulatory compliance (Existing Kazakhstan Legislation);
2. Exposure to new/potential liabilities (contingent liabilities); and
3. Levels of investment required to meet emerging national and international standards

AMEC undertook the assessment following an internationally recognised approach for large portfolio environmental due diligence assessments, which broadly followed the five elements listed below.

1. Project Strategy Agreement;
2. Document Review;
3. Site Visits;
4. ZhaikMunai Staff Discussions; and
5. Regulatory Discussions.

The assessment included a review of proposed and recently undertaken environmental, health and safety investment projects. These were used to aid in the cost assessment of various areas of identified investment requirement.

### **Environmental Findings**

The overall environmental status of the Chinarevskoye field and the level of environmental compliance of ZhaikMunai operations are considered to be of a high standard comparative to other similar operations in similar geographies and based on the experience of AMEC. However, some environmental issues and potential associated obligatory and contingent liabilities were identified in association with the current operating practices of ZhaikMunai.

A regulatory penalty is anticipated arising from volumes of gas flaring in excess of permitted limits. Furthermore, some additional contingent liability may be associated with the same issue if current operating practices continue in to 2008 prior to the commissioning of the first gas treatment unit.

The current practice of injecting waste process water to depth is un-permitted and as such has been identified by the MEP as a regulatory violation. This issue is currently being addressed, with necessary project plans under development. However, should project plans not be submitted for approval in time for the Q4 2007 deadline some future penalties may be levied in respect to this non-compliance.

A provision should be recognised for the future need for a drilling waste storage polygon in order to meet drilling slurry-pit free drilling practices that will be enforced in the future under new RoK legislation. ZhaikMunai anticipate that mud-pit free drilling will commence in 2008.

Finally, whilst secondary containment across the site is compliant minimum RoK legislation, a contingent liability is identified associated with the potential need to upgrade bunding around storage facilities in line with potential future legislative developments.

### **Health & Safety Findings**

The health and safety assessment of the operations of ZhaikMunai LP conducted by AMEC found the operational activities to be undertaken to a high standard in comparison to similar activities and geographies.

No obligatory costs were found to be associated with the ZhaikMunai activities.

Throughout the assessment minor contingent costs were identified that are not an immediate regulatory requirement but would require expenditure as a matter of good practice.

The health and safety permit status of ZhaikMunai was found to be compliant with the current activities undertaken as governed by Kazakh legislation specific to the oil and gas industry. The site inspections indicated a good standard of health and safety awareness and conduct in compliance with Kazakh operating standards.

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## **Explanation of Values**

All monetary values referred to in this document are in United States Dollars (\$) and based on 2007 price indices. Where it has been necessary to convert from other currencies to United States Dollars (\$) for consistency the following exchange factors have been applied.

- KZT T – USD \$ : conversion factor 0.00813

For the avoidance of doubt, where both an obligatory and a contingent cost are recognised for a specific issue, this is the representation of a perceived Best Likely Case (at a 50% confidence level) and a Worst Likely Case (at an 80% confidence level). Furthermore, in this case the contingent cost comprises the additional cost (over and above the obligatory cost) that is perceived to be likely as the result of some additional requirement. Further discussion of the definition of obligatory and contingent costs as they relate to this assessment is presented in Section 2.5.

## **Materiality**

For the purpose of the identification and reporting of environmental liabilities and regulatory issues a materiality threshold of USD \$50,000 has been applied for any individual item or aggregation of associated items.

As such where issues or items are identified as “material” or “significant” this refers to issues associated with liabilities with the potential to exceed USD \$50,000.

## **1. Introduction**

AMEC Earth & Environmental UK Ltd (AMEC) was commissioned by Probel Capital Management (Probel) to undertake an independent Environmental, Health & Safety Due Diligence Assessment of the ZhaikMunai LP Oil & Gas assets located in the North West region of the Republic of Kazakhstan (RoK).

The assessment has been undertaken in connection with a proposed Initial Public Offering (IPO) of the global depository receipts representing partnership interests in ZhaikMunai LP (GDRs) and the admission of the GDRs to the Official List of the UK Listing Authority and to trading on the London Stock Exchange's (LSE) market. Credit Suisse Securities (Europe) Limited and ING Bank N.V. London Branch are acting as joint fund managers in connection with the IPO.

This report has been undertaken in accordance with the requirements of International Standard 14015 - "Environmental Assessment of Sites and Organisations" (ISO 14015) and in part following the requirements of the International Accounting Standard No. 37 (IAS 37), which deals with the assessment of liability and contingent liabilities.

This report has been based on a review of data held at ZhaikMunai LP Head Office in Uralsk, visits to selected operational facilities and discussions with senior ZhaikMunai management.

### **1.1. Background**

AMEC is required to undertake an Environmental, Health & Safety Due Diligence Assessment of the ZhaikMunai LP assets in order to satisfy the environmental, health & safety audit requirements for companies proposing to list on the LSE.

AMEC understands that ZhaikMunai LP was established on the 20th of March 1997 by "Condensate-Holding" LLP (Kazakhstan) and "First International Oil Corporation" (USA) to exploit the Chinarevskoye gas & condensate field located in northwest region of the Republic of Kazakhstan. Furthermore, in September 2004, Probel Capital Management nv (Belgium), through Tensor Buy Out Fund, an investment vehicle organised to make equity investments in the emerging markets of CIS in the oil & gas industry became an investor in ZhaikMunai LP.

AMEC are advised that the Chinarevskoye field is located approximately 75 km west of the Karachaganak field and 80 km west of the regional centre Uralsk. The licensed site is bounded by the state border with the Russian Federation to the north, west and east. The total area of the field under exploration is 342 km<sup>2</sup>.

### **1.2. Site Description**

#### **1.2.1. Current Operational Status**

Reserves estimates have been performed by Ryder Scott and Netherland Sewell

Associates indicating proven discovered reserves in excess of 68 million barrels of oil and condensate and 270 billion cubic feet of gas and probable oil and gas reserves in excess of 109 million barrels and 250 billion cubic feet of gas. (figures to be revised by end of September 2007 after new report from Ryder Scott will be available).

According to ZhaikMunai LP the field is currently under exploration, but is producing marketable quantities of oil and condensate. Gas is also being produced in significant volumes and the construction of gas treatment facilities is under preparation. There are currently six wells producing a total of 5,700 barrels of crude and condensate per day. The average well depth is between 4,700 and 5,500m producing crude oils with an API of between 40-41.5 API and a sulphur content of 0.4%.

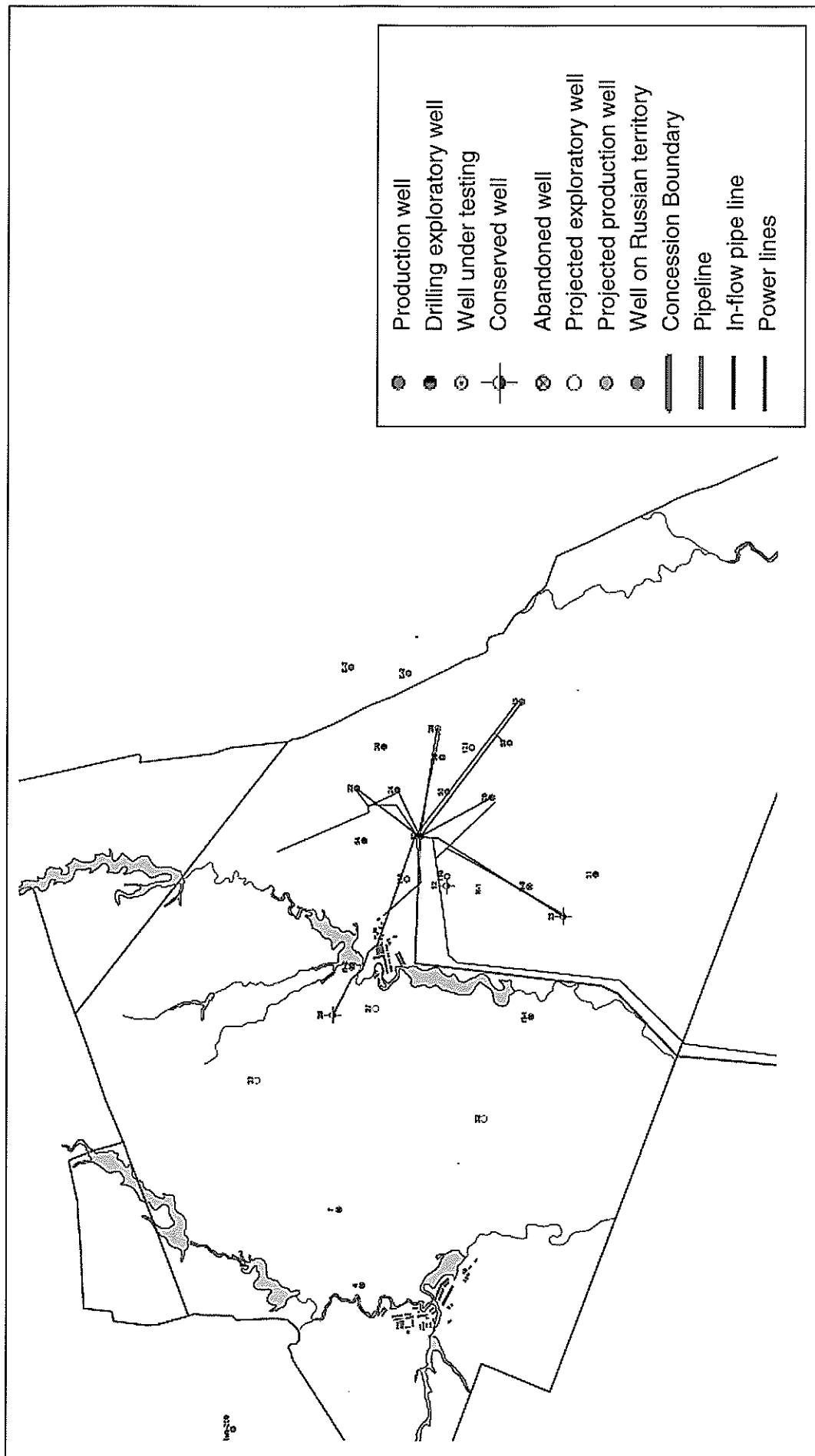
AMEC understand that the company is currently operating 16 deep wells (4.700 - 5.300 m depth), of which six wells are in oil-production, two wells in test production for different oil and gas-condensate reservoirs, five wells are under work-over operations (or waiting for work-over operations) and three wells are ongoing with drilling operations. Four heavy drilling rigs and three work-over rigs, from which one is used to drill water wells at a depth of 1000 m, are currently in operations at the field.

In addition, AMEC are advised that the company operates an oil treatment unit at a capacity of 400,000 t/a and living and working camps at field site.

Oil is currently being transported from the field by road to a train terminal. However, an oil pipeline (including main pump station) running from field site to a location of the field westwards from Uralsk city (120 km length) which includes a rail loading terminal is currently under construction and will start operations by the end of this year.

AMEC have also been advised that in addition to the above a demercaptanisation unit is under construction at the field within the oil treatment unit and several other new investments are under preparation.

Figure 1 Chinarevskoye field plan



### 1.2.2. Site History

Historically Uralsk Oil and Gas Exploration Expedition (UNGG) commenced exploratory drilling activities within the Chinarevskoye field in the mid 1960s including of the drilling of two wells to depths of 4566m and 3595m.

UNGG continued testing and exploration works between 1989 and 1993. During the exploration works, seven wells were drilled to various oil horizons. In 1991 industrial capacity inflow of gas condensate was received in Well 4 from a depth range of 5145m – 5171m.

In 1992 the industrial productivity of the Biysky horizon (5119m – 5097m) was approved in Well 10 (5210m). Gas condensate inflow was received from the Afonian horizon. Furthermore, the Tunisian layers were proven to contain oil. Drilling was ceased in 1993 due to a lack of Government funds and Well 10 was conserved.

In 1997 under ZhaikMunai management the Chinarevskoye field was reopened on confirmation of a license to develop and produce hydrocarbon raw materials. ZhaikMunai reinstated the 6 wells present on the field and confirmed State abandonment of the remaining wells.

### 1.3. ZhaikMunai Asset List

The following scope of upstream oil and gas operations undertaken within ZhaikMunai LP were considered under this environmental, health & safety due diligence assessment:

- Exploratory drilling activities;
- Production well status;
- Abandoned well status;
- Water well status;
- Oil Treatment Unit;
- Gas utilisation programme and infrastructure;
- Oil Pipeline (under construction);
- Demercaptanization Unit (under construction); and
- Oil Terminal (under initial construction).

At present, oil from the production wells is fed to the central oil treatment unit where gas and oil are separated through a 3-stage heat treatment system. At present the gas is flared and the oil is transported to Uralsk rail terminal via road tankers.

The proposed development of the field will include the demercaptanisation facility which will remove H<sub>2</sub>S and mercaptan sulphur for the oil. Furthermore, an oil pipeline (120 km) to Uralsk is currently under construction to transport the oil, rather than road tanker. This will include an oil terminal at the end of the pipeline in Uralsk.

In addition, a gas treatment facility (which forms part of the overall gas utilisation program discussed in Section 4.1.5.) is proposed to be built next to the oil treatment unit which will produce gas compounds such as pentane and butane and remove sulphur. A gas pipeline is also proposed to transport the gas to Uralsk.

## **2. Scope of Works**

### **2.1. Project Objectives**

The specific objectives of the assessment were to identify environmental, health and safety compliance and, where possible, quantify:

1. Regulatory compliance (Existing Kazakhstan Legislation);
2. Exposure to new/potential liabilities (contingent liabilities); and
3. Levels of investment required to meet emerging national and international standards

### **2.2. Project Approach**

AMEC undertook the assessment following an internationally recognised approach for large portfolio environmental due diligence assessments, which broadly followed the five elements listed below.

- Project Strategy Agreement
  - Agree Scope and Objectives; and
  - Agree Project Schedule (site visits and reporting).
- Document Review
  - Environmental, Health & Safety Investments;
  - Proposed Environmental, Health & Safety Projects; and
  - Environmental, Health & Safety Technical Data.
- Site Visits
  - Identification of New Liabilities;
  - Verification of Documentary Evidence; and
  - Characterization of identified/reported Liabilities.
- ZhaikMunai Staff Discussions
  - Operational Compliance Monitoring;
  - Environmental, Health & Safety Reporting Protocols;
  - Internal Practices for Environmental, Health & Safety Performance;
  - Regulatory Compliance; and
  - Foreseeable Predicted Expenditure and Technical Improvements with respect to New Liabilities.
- Regulatory (Ministry of Environmental Protection) Discussions
  - Regulatory Vigour & Enforcement;
  - Regulatory Compliance of ZhaikMunai LP; and
  - Identification of New Liabilities.

The assessment included a review of proposed and recently undertaken environmental, health and safety investment projects. These were used to aid in the cost assessment of various areas of identified investment requirement.

## 2.3. Environmental Assessment

The Environmental Risk Appraisal has been undertaken to international practice standards, based on the methodology of the International Standard ISO 14015, "Environmental Assessment of Sites and Organisations". As such it does not include any specific 'sampling' but has applied the following assessment framework:-

- To establish the criteria against which the gathered information will be assessed i.e. any technological limitations, current national legislation and appropriate international legislation;
- To gather and, where possible, confirm the appropriateness of relevant information;
- To identify and evaluate significant environmental issues;
- To determine potential business consequences associated with the above issues i.e. financial liabilities/benefits or corporate reputation risks; and
- To quantify, as possible, the liabilities/ benefits.

The study considered, but was not necessarily limited to, considerations of the following: -

- The site locations and their physical characteristics (topography, nearby surface water courses, ground water aquifers, etc.)
- Uses of the surrounding land and nearby water bodies (residential, socio-economic or culturally sensitive areas, fisheries, drinking water resources, transport routes, etc.)
- Present and former uses of the sites, particularly with regard to potential for existing soil or ground water contamination
- History of any catastrophic events, such as bulk liquid spillages and leaks, fires, floods, etc.
- Hazardous materials (fuels, water treatment chemicals, plant cleaning fluids, asbestos, polychlorinated biphenyls, ozone depleting substances, etc.)
- Management and disposal of hazardous and non-hazardous wastes
- Pollutant releases to air, water and land
- Occupational health and safety
- Legal status with respect to environmental permits and licences

### 2.3.1. Project Strategy Agreement

AMEC were commissioned by ZhaikMunai to undertake an agreed scope of works in accordance with ISO 14015:2001. This commenced with AMEC submitting a "Project Initiation List" (Appendix A), setting out issues to be addressed and a proposed schedule for discussion. This was followed up with a pre-project strategy meeting, held at the Uralsk, ZhaikMunai Head Office between AMEC (project manager) and ZhaikMunai (Company Finance Director and Senior Management) on 27<sup>th</sup> August 2007.

During the meeting topics discussed included the approach, environmental, health and safety aspects to be addressed by the audit. During the initial meeting a site visit schedule, interview programme and discussion meeting were organised and agreed upon as presented within the "In Country Activity Log (Appendix B)". The majority of interviews were conducted in Russian, being translated into Russian for those

English project staff as necessary. As set out within the scope of works the draft reports were submitted in English. The resources for the project were restricted to AMEC personnel. ZhaikMunai provided transportation to the relevant oil field facilities on the 28<sup>th</sup> August 2007.

### **2.3.2. Document Review**

As part of the environmental due diligence assessment AMEC undertook a detailed document review of relevant documentation held at both the ZhaikMunai Head Office and the main oil field site office.

AMEC reviewed the data with the focus of obtaining the necessary information for assessing the compliance status of the current operations with Kazakhstan regulations and standards. The main documents reviewed are referred to within the relevant sections of this report and presented within the "Project Document Index" Appendix C).

The main document review was undertaken between the 27<sup>th</sup> and 31<sup>st</sup> August 2007.

### **2.3.3. Site Visits / Facility Inspections**

AMEC and ZhaikMunai agreed upon a schedule of site inspections, which were undertaken by teams of suitably experienced environmental specialists from the AMEC offices located in London (UK) and Uralsk (Kazakhstan) offices. Appendix D presents details of the "AMEC Project Team". In addition, we supplied a technical interpreter for the duration of the in-country meetings and site visits. The interviews were conducted in Russian and translated into English. Notes were taken by AMEC audit staff, findings / issues recorded on individual audit sheets for the facilities which can be presented on request. The objective of these inspections / interviews was three-fold:

- To confirm the information gained from the document review through site observations and interviews of appropriate personnel, including ZhaikMunai staff and staff of the Ministry of Environmental Protection (MEP);
- To add additional practical detail to individual site findings based on site observations, reports and findings; and
- To ascertain the surrounding environment of the facilities, so that the risk assessments can be location-specific and, therefore, proportionate to the actual practical consequences of the risks involved.

The main site visit to the Chinarevskoye field was undertaken on Tuesday 28<sup>th</sup> August 2007.

Appendix B presents the site inspection schedule, personnel interviewed and the AMEC in-country project team. A selection of site photographs of the asset list physically inspected by AMEC is presented in Appendix E.



## **2.4. Health & Safety Assessment**

In addition to the environmental risk appraisal, AMEC undertook an overview of Health and Safety (H&S) matters so far as were readily available, incorporating document review, management reports and observations during site visits. The H&S audit was undertaken to provide an indication of significant H&S issues associated with the company.

## **2.5. Financial Reporting Standard**

The due diligence assessment protocol adopted by AMEC followed, as broadly as possible, the International Accounting Standard No. 37 (IAS 37), with the assessment of obligatory costs and contingent costs.

### **2.5.1. Obligatory and Contingent Liabilities**

Under IAS 37, the terms of liability are broadly categorised as follows:

- **Obligatory Liability**
  - Defined as expenditure that is required to comply with current Kazakhstan legislation and includes such items as :
    - Standards of air emissions;
    - Waste handling and disposal;
    - Water and waste water handling, disposal and monitoring; and
    - Contaminated land (known issues).
- **Contingent Liability**
  - Defined expenditure that is contingent on some other matter either taking place, emerging regulatory control measure, historical and as yet unknown or not yet quantifiable event or contingent on the identification of a problem through further assessment or investigation.

Where areas of strict non-compliance that are not, at present attracting fines or any levy from the government have been identified, it has been assumed that as these are strictly a non-compliance they are to be reported as such and their appropriate remedy or abatement costs has been identified, in this report, as an obligation.

It remains a possibility that, going forward, the regulatory authorities will, in the short term, and often until suitable technology is available to deal with a specific issue, ignore the situation and continue not to fine such non-compliances.

However, it also remains a possibility that under new ownership, such as a change in shareholder structure, the regulator may take a more strict approach to non-compliances. However, this is considered only to occur where severe breaches of environmental and / or health and safety infringements have occurred, such as

gross impacts to the environment from long standing historical contamination, as such, not associated with ZhaikMunai LP.

## **2.6. AMEC Representation**

The following representation from AMEC was in attendance at site visits and discussions:

- Gavin Cuthbert – AMEC Project Manager – London (United Kingdom);
- Stephen Gill – AMEC Environmental Consultant – London (United Kingdom);
- Arman Khuzhaniyazov – AMEC Environmental, Health & Safety Advisor – Uralsk (Kazakhstan); and
- Nadia Makhmetova – Independent Translation Services – Uralsk (Kazakhstan).

The following individuals offered desk-based (London) support:

- Ben Sawford – AMEC Director; and
- Alec Jones – AMEC Associate Technical Director.

### **3. Relevant Environmental, Health & Safety Legislation**

The principal guiding legislative instrument in Kazakhstan regarding the natural environment is 'The Law of the Republic of Kazakhstan (RK) on Environmental Protection' developed in 1997. The central aim of the law is to determine the legal, economic and social base for environmental protection in the interests of present and future generations and is aimed at ensuring ecological security, prevention of damaging effects to natural ecosystems from economic and other activities, preservation of biological diversity and the rational use of the environment.

This law encompasses many areas of the environmental responsibilities of state, public and private entities. The obligations for abatement of emissions in keeping with normative guidelines and the assessment of the impacts of activities on the environment by means of environmental monitoring are also defined.

The Government of the RK has carried over FSU standards to provide a baseline of normative values against which compliance and levels of emissions can be compared.

In the absence of specific RK standards GOST (Russian Governmental Standards) comprise the principal tool for the regulation of environmental monitoring methodology and define acceptable approaches to evaluating environmental impacts.

#### **3.1. Introduction to Legislative System**

The Ministry of Environmental Protection (MEP) is the governing body regulating environmental issues. Under the current regime state, public and private entities engaged in activities that utilize or impact upon the natural environment or natural resources are governed by two basic divisions of permit; The Nature Use Permit and The Subsoil User Permit issued by the territorial authorities. In addition water-use contracts are obtained from the Water Resources Committee.

##### **3.1.1. Nature Use Permits**

In order for a company to undertake activities in terms of nature use (municipal construction, land area improvement, laying of pipelines, installation of various buildings and facilities) there is an obligation under RK Environmental legislation to obtain a Nature Use permit, specific to the period of operations. However, specific permits apply to granting construction works the Nature Use permit regulates the impact to the environment.

To obtain a Nature Use Permit an annual application is submitted to a Regional Environmental Department (RED) which is then reviewed by the State Environmental Expert Review Board, an internal division of the MEP. The Nature Use application is evaluated on the strength of the deliverables it presents.

On approval of the permit application the company is authorized to carry out proposed operations strictly within the scope described by the application. Once operations come to an end, a State Environmental Control Committee evaluates the state of the operational area prior to expiration of the permit. Certain fines and penalties are imposed on a company in cases of non-compliance with the State Environmental Conservation Requirements.

### **3.1.2. Subsoil Use Permits**

Intrusive activities (geological works, exploration development and production drilling and seismic operations) require a Subsoil Use Permit. To obtain the Subsoil Use Permit an annual "Work Program" for subsoil use is submitted to the Regional Geology and Subsoil Use and Protection Committee. The contract is arranged on approval for several years with the working program being approved on an annual basis.

## **3.2. Relevant Environmental Legislation**

The following list, below, presents some the relevant legislation enforced within the Republic of Kazakhstan:

- Kazakhstan Constitution;
- Water Code;
- Land Code;
- Law of RK "On Environmental Protection";
- Law of RK "On Environmental Evaluation";
- Law of RK "Preservation of Atmospheric Air";
- Law of RK "On Wildlife Conservation, Reproduction and Management";
- Law of RK "On Specially Protected Natural Areas";
- Law of RK "On Radiation Safety";
- Law of RK "On Energy Conservation";
- Law of RK "On Emergency Situations of Natural and Industrial Nature";
- Law of RK "On Sanitation and Epidemiological Safety of Population";
- Law of RK "On Standardization";
- Law of RK "On Phyto-Sanitary Control";
- Decree of the President of RK "On Subsoil and Subsoil Reserves Management"; and
- Decree of the President of RK "On Petroleum".

### **3.2.1. Kazakhstan Environmental Code**

A new draft Kazakhstan Environmental Code has and continues to be developed drawing on certain international and EU standards. The implementation of this environmental code continues to develop and enhance environmental protection measures throughout the state, which is due for release in the near future.

### **3.3. Health & Safety Legislation**

#### **3.3.1. Kazakh Legislation**

The main law governing labour rights within Kazakhstan is the RoK Labour Law 1999, which came into force on the 1<sup>st</sup> January 2000. This law forms the backbone for regulations and conditions specific to employee health & safety in Kazakhstan.

More specifically, the Republic of Kazakhstan, Ministry of Oil & Gas Industry and the Ministry of Geology and Mineral Wealth Protection has produced "Safety Rules in the Oil & Gas Industry of the Republic of Kazakhstan (1996)". These Regulations have been developed by the State Enterprise "Main Oil-Gas Inspection" along with opinions from oil and gas industry leading specialists in geological exploration and scientific-research institutes. The safety rules are specific to operational activities undertaken within the oil and gas industry and were used as the main audit tool during the health & safety assessment in order to confirm the company's general compliance with specific documentation relating to the oil and gas industry.

#### **3.3.2. World Bank Standards**

Further to Kazakhstan regulations reference during the audit to World Bank standards and indicators was also used when applicable.

As of April 30, 2007, new versions of the World Bank Group Environmental, Health, and Safety Guidelines (known as the 'EHS Guidelines') were issued.

The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in the International Finance Corporation's (IFC).

The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC-financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project- or site-specific requirements.

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

Furthermore industry sector guidelines from the IFC exist for "Onshore Oil and Gas Development" which have been noted during the health and safety audit. The document specifically addresses industry specific impacts and management as well as performance indicators and monitoring.

## 4. Overall Environmental, Health & Safety Permitting Compliance

### 4.1. Environmental

#### 4.1.1. Environmental Permitting

As discussed in Section 3.1 of this report a number of Permits are required under RoK law. During the AMEC site visit the following operating and resource exploitation permits were made available for review:

- Ministry of Environmental Protection
  - Nature Use Permit #007853 – 15.12.06
  - Nature Use Permit #0020285 – 08.11.06
  - Nature Use Permit #0020029 – 23.03.06
  - State Licence #00116P for implementations of ecologically hazardous activities. – 21.06.04
  - Conclusion of the State Environmental Expertise on the Technological Scheme of Development of Northeast Deposit; Tunisian Horizon – 26.10.06
- Ministry of Energy and Mineral Resources
  - Licence Granting the Right to Use the Subsurface in the Republic of Kazakhstan – MG-series #235-D (oil) – 26.05.1997

It is considered by AMEC that the permits referenced here comprise the currently necessary regulatory authorisations required to operate and develop the Chinarevskoye field in line with reported ZhaikMunai ambitions. It is noted however, that future permits are required for later phases of development and permits such as the Nature Use Permit are revised on an annual basis. Though there is no guarantee that permitting conditions may change in the future, there are no currently identified operating issues that is considered likely to result in significant changes to permitting conditions.

#### 4.1.2. Environmental Payments

In accordance with the Nature Use Permits and RoK law ZhaikMunai is required to make annual payments based on the number of specific substances emitted to the atmosphere.

The company provided details of the payments made for the following periods:

- 1<sup>st</sup> Quarter 2007 (doc: 1.2.h)
  - Total Payment – KZT 17,162,505
- 2<sup>nd</sup> Quarter 2007 (doc: 1.2.i)
  - Total Payment – KZT 40,077,813
- Year 2006 (doc: 1.2.j)
  - Total Payment – KZT 76,169,133

It is reasonable to assume that environmental payments on a similar scale will continue in future years of operation and that the level of such payments will increase broadly in proportion to increased operations and production as the field is developed.

#### **4.1.3. Penalties**

Certain potential regulatory penalties were identified during the review of documents made available by ZhaikMunai, specifically exceedance of gas flaring volumes and lack of approval documents with regard process water injection. These penalties are anticipated by the company to be of a one time monetary payment, if indeed occurred and not to pose any significant threat to operations. It is the opinion of AMEC that this is likely regulatory response to the identified non-compliances identified during MEP inspections. Specific potential penalties are discussed further in the relevant section below, in specific regard to atmospheric emissions and waste water.

#### **4.1.4. Land Quality**

The field though subject to exploration activities since the 1960s has only recently become subject to significant project development and productions. As such the conditions encountered were generally better than may be anticipated in other operations subject to long operational histories. Land quality appeared to be generally of a good standard across the field from purely visual observations during the AMEC site visit (no intrusive or in-depth inspection were made).

Furthermore, site management report that there is no know significant contamination to surface or sub-surface. Soil quality testing campaigns are undertaken by third party contractor on an annual basis and the results of which reviewed and approved by the MEP in line with the requirements of operating permits. Samples are taken at five discreet locations; one central to the field and a four points on the boundary of the sanitary zone.

##### ***Groundwater Monitoring***

An MEP approved groundwater monitoring plan has been developed by ZhaikMunai and this was made available to AMEC for review. Currently however, existing water abstraction wells are typically used for sampling both for chemical analysis, On a quarterly basis, and groundwater level, on a monthly basis.

Though of variable depth of occurrence, it is understood through discussion with ZhaikMunai LP environmental management that groundwater typically occurs below 20m across the operational areas of the field. It is understood that water utilised by regional towns and villages exists at shallower horizons. Furthermore, occurrence of ground water below 20m is below the threshold at which more stringent groundwater monitoring is typically enforced.

#### **4.1.5. Atmospheric Emissions**

The principal sources of atmospheric emissions associated with operations of ZhaikMunai arise from the flaring of associated gas produced as a by product during oil production and well testing. In line with RoK legislation the flaring of associated gas is to be phased out by 2009 (See Section 3 for further detail).

## Gas Utilisation Plan

It has been agreed (contract signed 10<sup>th</sup> August 2007) with a contractor consortium consisting of KSS (a local contractor) and Hanover (an international contractor) for a USD \$182 (w/o VAT) million turnkey implementation and construction project to entail 2 gas treatment unit trains.

- Train 1 – Associated gas utilisation in association with gas turbine for power generations; and
- Train 2 – Complex gas treatment producing marketable products, including Butane, Propane, stabilised gas condensate and pelletised sulphur.

This contract encompasses the following elements of the Gas Utilisation Programme:

- Engineering design;
- Project approval;
- Fabrication and delivery;
- Civil works and commissioning;
- Training; and
- Bringing units to design parameters.

The Gas Utilisation Programme comprises the following basic elements with specific performance guarantees provided by project contract, including 10% of project value for significant delay or non attainment of identified project design parameters.

**Table 1 Gas utilisation Programme**

Action/Item	Completion Date
Programme Feasibility Study	Completed April 2006
Submission for Approval	Completed August 2006
Construction of 2 treatment units	EPC contracts began 2007
Delivery of units	EPC contracts began 2007
Commencement of construction	Began 2007
Gas Export Pipeline commencement	Began 2007
Commissioning Train 1 and Power Generation	September 2008
Commissioning Train 2	2009

## Penalties

The report following the MEP Environmental Inspection of the operations at Chinarevskoye (doc: 1.6d 23.04.07) cited an exceedance of permitted flaring volume as a regulatory violation. ZhaikMunai anticipates a penalty to be levied in response to this issue. Such a penalty would typically be to the order of 10 times of the standard annual environmental payment for the practice of gas flaring.

Zhaikmunai has paid so far for the year 2007 an amount of \$206,119 (or \$122 per tone). Based on currently reported production profiles and forecasted test production out of gas-condensate wells an overall amount of 25,000 tons of air pollution is expected by the company for the year 2007.

Zhaikmunai has so far just 3,000 tons approved by authorities. The potential remains that the company may be required to pay some \$2.6 million in fines should the applied 25,000 tons not be approved.



Consequently, contingent liability to the order of \$2.6 million should be anticipated in the case that a derogation to fare to the necessary volumes is not forthcoming. Furthermore, an additional contingent liability to the order of \$2.6 million should be anticipated should flaring volumes continue at the same level, with no increase to permitted flaring volumes, until commissioning of the first gas treatment unit in 2008. Consequently, AMEC identify a potential contingent liability in 2008 in the case that such fines or limitations to operations are incurred.

#### 4.1.6. Environmental Plan

Company forecasted budgets for environmental expenditure (included in appendix F) were made available for review and appear to be adequate and realistic in relation to the scope of activities anticipated and allocated capex.

Further to this a detailed Environmental Plan for 2007 was reviewed detailing the planned environmental projects and allocated capex. The Environmental Plan is presented in the following table.

**Table 2 Environmental Plan 2007**

<b>Action</b>	<b>Anticipated Capex (KZT)</b>
<b>Monthly Ecological Measures</b>	
Sanitary cleaning	200,000
Subscription for magazines	15,000
Internal Audits - Monitoring of environmental works throughout operational area	600,000
<b>Atmospheric Emissions</b>	
Monitoring atmospheric emissions	350,000
Execution of Gas Utilisation Programme – Allocation of orders for technical equipment	130,000,000
Demercaptanisation Unit construction	200,000,000
<b>Land Resources</b>	
Soil monitoring	50,000
Recultivation of lands following construction of internal roads	320,000
Liquidation of drilling slurry pits and associated elements of well drilling activity	10,400,000
Re-vegetation of territory at well locations and camp	50,000
General domestic waste removal to municipal polygon	25,000
<b>Water and Wastewater</b>	
Water monitoring – Sampling of river	50,000
Collection and disposal of septic/domestic effluent by third party contractor	70,000

#### 4.1.7. Environmental Monitoring

Environmental monitoring is conducted by the Laboratory of the Centre “Sanepidexpertisa” which include air monitoring points at the facility boundary, the village and the edge of the sanitary zone. The emissions to date do not exceed the set norm values for the facility.

#### **4.1.8. Exit Strategy and Insurance**

In accordance with requirements and international standards ZhaikMunai annually accrues capital to a dedicated exit strategy (or liquidation fund) with a projected total value to the order \$12 million. A specific strategy and exit plan is not yet developed, however this is not a current regulatory requirement due to the substantial projected asset life remaining.

The company maintains an environmental insurance policy. The certificate of insurance for the period 01.01.2007 – 31.12.2007 (doc: 1.2.c) was made available for review by ZhaikMunai. According to the insurance certificate reviewed the maximum amount of responsibility of Insurer per insurance claim is KZT 127.98 million.

### **4.2. Health & Safety**

The Health & Safety appraisal undertaken by AMEC included the following:

1. Head Office document review of permitting and senior management interviews;
2. Chinarevskoye site office document review; and
3. Inspection of operational activities at the Chinarevskoye field.

#### **4.2.1. Health & Safety Permitting**

Oil and gas operations within Kazakhstan are governed by the Minister of Emergency Response Department (MERD) with respect to industry specific health and safety requirements. Furthermore, the Main Oil & Gas Inspection Regulations 1996, set out mandatory standards that such operations should adhere to through approved documentation. These mandatory standards are presented with Appendix G. As part of the H&S assessment, AMEC requested that ZhaikMunai provide evidence that these documents were present and authorised by the appropriate regulatory bodies. AMEC can confirm that ZhaikMunai produced the full complement of documentation upon request highlighting regulatory compliance with health and safety protocols within the Kazakhstan oil and gas industry. A list of the documents presented to AMEC is also listed in Appendix G.

#### **4.2.2. Chinarevskoye Site Health & Safety Review**

During the site visit undertaken on Tuesday 28<sup>th</sup> August 2007, AMEC undertook an inspection of the Health & Safety documentation held at the main site office. AMEC found the documentation to be compliant with regulatory requirements.

Furthermore, this site document inspection included inspection of Health & Safety audits conducted by the Department of State Control for Emergency in Western Kazakhstan. The scope of the most recent audits undertaken on the 11th July 2007 (Appendix C, HS1) included:

- Review of actions not yet implemented from the previous audit which included 28 items;

- Inspection of current camping and cargo-lifting cranes;
- Inspection of De-waxing Unit;
- Inspection of gas facilities;
- Inspection of wells;
- Inspection of Flaring Unit
- Inspection of Oil Processing Unit
- Inspection of Oil pumping station/Loading dock
- Inspection of Warehouse
- Inspection of Oil Refuelling Station

AMEC consider that the comments noted by the inspectorate were not of a significant financial risk to the company and ZhaikMunai management indicated that provisions are in place to implement the required prescriptions.

#### **4.2.3. Health & Safety Site Inspections**

The site visit was undertaken on Tuesday 28<sup>th</sup> August 2007. The operational health and safety protocols observed on site were found to be compliant with Kazakhstan standards. Specific observations regarding operational activities for specific operations are discussed in detail in Section 5 below for each operational activity.

#### **4.2.4. Chinarevskoye Field Security**

The field has no site boundary fence however ZhaikMunai employs the Kazakh military on site to provide site security services. Security personnel are located at the entrance to the field, at the OTU and each drilling site.

### **4.3. Social**

#### **4.3.1. Village Relocation**

The village of Rashcova (Appendix E, Photo 12) is located within the Chinarevskoye field area. The development of the field requires the relocation of the village inhabitants. A regional government authorisation has been issued to ZhaikMunai to undertake this project (doc: 1.8a, issued 18.04.07).

The obligations of ZhaikMunai as a result of relocation of the Raschova comprise the allocation of compensation or of suitable alternative housing of not less than 15m<sup>3</sup> per person.

In response to public consultations all inhabitants have reportedly opted for inclusion in the provision of alternative housing in the city of Uralsk. The company reports that they have begun the construction of a 90 apartment block complex to house the relocated population.

The total cost associated with the relocation project is anticipated to be to the order of \$2.5 million under a best likely case and up to \$3 million under a worst likely case. A contingent liability should be considered, to the order of \$0.5 million, over and above the budgeted \$2.5 million in the case that additional works are required.

## 5. Specific Asset Operational Findings

### 5.1. *Exploratory Drilling Activities*

Four exploratory wells are currently being progressed at the Chinarevskoye field, typically to a depth of approximately 5,000 m (wells No. 31, 32, 27 and 33). Drilling activities are contracted out to two contractors:

- Uralsk Nefte Gas Geology (UNGG)
  - A local contractor operating two ageing rigs on site.
- Saipem
  - A subsidiary of Eni operating two modern rigs on site.

The Sapiem rig inspected appeared to be in good working order and the drill site generally well managed (Appendix E, Photo 5, 6, 7 and 8). However, the UNGG rigs were noted to be ageing and of a variable state of repair (Appendix E, Photos 1, 2, 3 and 4). Both drilling rigs had State approval for the drilling activities they were undertaking as presented to AMEC while on-site.

#### 5.1.1. **Waste Management**

Drilling activities give rise to significant volumes of drilling slurry, principally comprised of muds or cutting arisings from the well. Groundwater is abstracted from local ground water via an abstraction well located at the drilling site to mix with drilling muds. This waste slurry is currently directed to plastic lined slurry pits (Appendix E, Photos 4 and 8). The slurry pits are terminated by evaporation of the water, folding over the plastic sheeting, laying a concrete pad and reinstating the surface with topsoil and seeding.

This practice is compliant with current RoK legislation and authorisation for current drilling projects issued by the MEMR and MEP (docs: 1.4.d, 1.4.e and 1.4.f) were made available for review by ZhaikMunai.

For future drilling projects however in line with pending amendments to RoK legislation “mud-pit free drilling” will be a requirement. As such the approach to the drilling of future exploratory and production wells will require that all arisings are stored on site, dried and transported to a dedicated polygon (appropriate and impermeable waste containment facility, usually of cement construction) where it should be stored permanently. Furthermore, such waste facilities are required to be monitored by the installation of 4 groundwater monitoring wells.

Consequently an obligatory cost to the order of \$1.5 million should be realised for the provision of an adequate and approved drilling waste storage polygon. Such a polygon would typically be associated with four dedicated groundwater monitoring wells and a program of ongoing monitoring and waste management. ZhaikMunai anticipate that mud-pit free drilling will commence in 2008. The regulatory implementation of mud free drilling is anticipated in 2008, for which ZhaikMunai LP have accounted for in future projects.

Other wastes generated are typically restricted to limited quantities of domestic waste, packaging and used lubricant oil drums. These are collected and disposed of

by certified third party waste contractors, for which contractual agreements were made available for review by ZhaikMunai (docs: 1.4.a and 1.4.b).

### **5.1.2. Land Quality**

As part of the wider recultivation approach adopted by ZhaikMunai and approved by the MEP(doc: 1.1.a) a number of measures are undertaken to ensure that disturbance is minimised and remediated following the completion of drilling activities.

The upper 50 cm of top soil is removed for the drill pad, the 3.09 ha area associated with drilling activities. The top soil is stock piled at the drill site and is re-instated following the completion of drilling and decommissioning of the well or installation of a production well heads.

AMEC viewed both exploratory well drilling sites under operation and following re-instatement and in both case the surface conditions appeared to be good and the clearance of top soil (and storage for re-instatement) in line with MEP approved operating practices was observed.

### **5.1.3. Flooding**

Drill site flooding is reported to pose an operational issue. As part of the overall recultivation strategy for the well sites, 50 cm of top soil are removed from the drilling pad. The resultant drop in ground level leads to flooding issues at the drill sites, particularly during spring and autumn. Whilst the removal of top soil is a prudent and preferable approach, allowing effective recultivation, it is noted that site flooding may increase the likelihood of migration of contaminants in the case of a release.

No specific material liabilities are identified in relation to flooding.

### **5.1.4. Water and Wastewater**

As part of the approved well development approach a water abstraction well is installed at each exploratory well location in order to supply water for technical uses, typically the production of drill slurry to facilitate drill progression at depth. The typical depth of the ground water abstraction wells is approximately 70m below surface level. Some groundwater abstraction wells are also monitored as part of a groundwater monitoring regime.

Waste water produced in the form of spent drilling slurry is stored in an impermeable drilling slurry pit and allowed to evaporate.

The following regulator approvals were made available by ZhaikMunai:

- Approval No. 108 – 03/2007 for water use at well No. 26111 – MEMR (doc: 1.3.e)
- Conclusion No. 152 on special water use – Dept. of Sate Sanitary Inspection (doc: 1.3.f)

- Approval for environmental protection of ground water use – MEP (doc: 1.3.g)

#### **5.1.5. Air Emissions**

There are typically no significant atmospheric emissions associated with drilling activities. However, in accordance with regulatory design requirements there are two emergency flare pits. These however, are intended only for emergency use.

#### **5.1.6. Health & Safety / Fire Safety**

Fire safety measures appeared to be well maintained on the newer Saipem rigs. However the UNGG rig appeared to have ageing and insufficient fire fighting equipment, although the State had undertaken an audit of the rig and given drilling approval as reviewed on site by AMEC.

#### **5.1.7. Materials Handling / Storage**

During the inspections of the two drilling locations AMEC viewed the areas designated for bulk fuel storage and containment. Both locations had bunded areas compliant with current Kazakh regulations, however the UNGG bund area was in need of upgrade as a matter of good practice (Appendix E, Photo 2).

#### **5.1.8. Deleterious Materials**

No significant ODS, ACM or PCBs are considered to be associated with the OTU due to the recent age of construction.

### **5.2. Production Well Status**

According to company reports some 5 wells are engaged in active production at present (wells No. 20, 22, 50, 56 and 53). In addition two wells are undergoing work-over and a further 3 wells are under long term testing, all of which are anticipated to come on-line in the near future.

Production wells typically consist of a re-instated exploratory well footprint, two emergency flare pits, a Christmas tree well head, pigging station and flow line connection. The production wells are manned on a 24 hour basis.

#### **5.2.1. Land Quality**

The production wells are being drilled in areas of virgin land with no known previous contaminated land issues. Prior to establishment of the drilling rigs the fertile topsoil is removed and placed in piles external to the foot print of the drilling site.

Furthermore, a clay bund is constructed around the external perimeter of the drilling footprint to prevent potential spills or well blow-outs from migrating off-site. On completion of the drilling the clay bund is reduced to a smaller area to house the

production well equipment and the external area is recultivated with the topsoil and seeds. On inspection of Production Well No. 56 (Appendix E, Photo 13, 14 and 15) no visual surface signs of contamination were observed. No significant land quality issues associated with the production wells are considered to exist by AMEC.

Once installed, the production well is a relatively self contained system of operation, for which the following issues are not applicable such as waste management, sanitary / waste water, air emissions, materials handling, ozone depleting substances, asbestos containing materials, PCBs and environmental monitoring.

### **5.2.2. Health & Safety / Fire Safety**

Each production well is overseen by physical presence of an engineer equipped with an individual H<sub>2</sub>S monitoring device and radio communication to the oil treatment unit.

### **5.2.3. Flow Lines**

A network of flow lines are installed at 2 metre depths carrying the produced oil and gas mix from producing wells to the OTU. These flow lines are of a durable plastic construction, and as such less likely to suffer corrosion issues as equivalent steel flow lines. Furthermore, each producing well is equipped with a pigging system to facilitate a regular programme of flow line cleaning. Flow lines are pressure tested prior to commissioning.

## **5.3. Abandoned Well Status**

The field includes 6 abandoned wells (Nos. 1, 2, 4, 5, 7 and 9) previously drilled for exploration activities during the initial exploration of the field in the mid 1960s. These wells underwent decommissioning activities in line with regulations for liquidation of wells. The Department of West Kazakhstan Oblast State Technical Inspection and the Uralsk Military undertook inspections of the decommissioned wells and authorised the decommissioning works (doc: 1.1.b-f).

### **5.3.1. Land Quality**

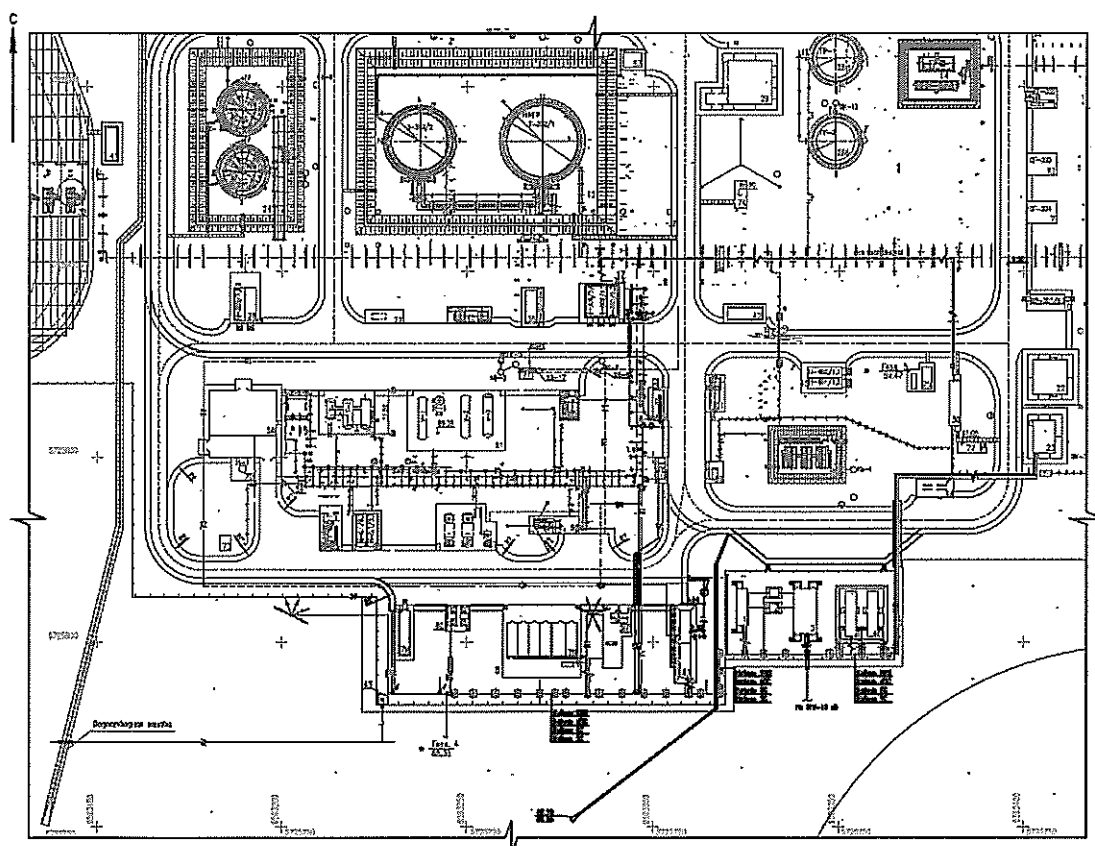
During the site visit the decommissioned well No. 2 (Appendix E, Photo 11) was inspected and observed to be decommissioned as set out within the authorised documentation pursuant to the laws of the RoK. No visual evidence of surface contamination was evident in the immediate area. No significant land quality issues associated with the production wells are considered to exist by AMEC.

Once decommissioned, the abandoned wells are inactive and inert for which the following issues are not applicable such as waste management, sanitary / waste water, air emissions, materials handling, ozone depleting substances, asbestos containing materials, PCBs, environmental monitoring and health and safety.

## 5.4. Oil Treatment Unit

ZhaikMunai operates an oil treatment unit at a capacity of 400,000 t/a, the plan of which is presented in Figure 2. The unit currently receives crude oil from the operating production wells on the Chinarevskoye field. The oil enters the treatment unit through 6 manifold inlets and passes through a three stage oil / gas separation system as presented in Figure 2. AMEC were informed by the treatment unit management that the oil contains <1% water, hence oil/water separation is not required. The gas is currently flared at a stack and the oil is passed to 2 storage tanks of 2,000 and 3,000 cubic metre (cu. m) capacity. Crude oil is currently transported from site by road tanker to the oil to a rail terminal at Uralsk. The treatment unit transports approximately 40 tanker loads a day and the storage tanks are capable of holding 1 week's production before over capacity is reached. Photos are presented in Appendix E (Photos 16 to 22).

**Figure 2 Oil Treatment Unit Plan**



### 5.4.1. Land Quality

The treatment unit has been constructed on virgin land with no known former contamination issues. During the site visit no observations of oil / other contamination were noted at the surface of the facility. The facility is well maintained and set out. It is unlikely that contaminated land issues currently exist at this location.



## 5.4.2. Waste Management

No significant quantities of solid waste materials are generated on-site. Used oil filters and oily rags and material are disposed of by a licensed waste contractor. Evidence of such agreements with waste contractors was supplied in terms of contracts between ZhaikMunai and waste contractors Spetstobasa and MGK DEP OZhKH PT and AD were reviewed by AMEC.

## 5.4.3. Waster and Wastewater

### *Groundwater Abstraction*

Groundwater is abstracted for technical use in oil treatment processes at the OTU, including de-salting and heating of certain units. The MEP approval for this practice was reviewed by AMEC.

The MEP approval states that according to the calculated technical water usage requirements for the operation of the OTU of 16,425 m<sup>3</sup>/yr and 45.5 m<sup>3</sup>/day do not exceed the regulatory threshold of 50m<sup>3</sup> per day above which a specific permit for groundwater abstraction is currently not required.

It should be borne in mind that additional infrastructure currently under construction and planned increases in production capacities will likely result in a significant increase to the current rates of water abstraction and usage. Consequently, a permit for groundwater abstraction at the OTU will likely be required in the future. There were no obvious or reported indication that such a permit would not be readily forth coming.

### *Injection of Process Water*

Waste process water is currently injected to depth via one injection well no. R1 located at the OTU. The company plans to increase the practice of process water injection in line with the development of the field and increased production, with the aim of utilising waste water and maintaining reservoir pressure at depth.

However, the current practice of waste water injection was cited as a regulatory violation in the MEP inspection report (doc: 1.6.d - 23.04.07). The practice of water injection had not been specifically permitted and no project plan produced or submitted to state expertise for approval.

The MEP inspection required actions call for the submission of a project plan for approval by 4<sup>th</sup> Quarter 2007. It was reported by ZhaikMunai management that such a project plan is currently being developed and is expected to be completed by 1<sup>st</sup> Quarter 2008. In the case that and acceptable project plan is submitted by the close of 4<sup>th</sup> Quarter 2007 there is no indication that any further regulatory action will be incurred with regard to this issue. However, in the case that this requirement is not met the potential remains that a penalty may be levied by the MEP or that the operation of such a process is required to be ceased.

The exact extent of such a penalty is not known. It is considered likely that such a penalty, if incurred, would be material but not exceeding a level that might serious impact the viability of operations given that the activity is typical of other similar oil

production operations and that necessary project plans for approval are currently under development.

#### **Sanitary Water**

Sanitary water, domestic waste water for example arising from camp facilities, is collected within a local septic tank and collected and disposed of by a licensed contractor from Uralsk. An example waste acceptance note issued by Oral Su Arnsy Co. was provided by ZhaikMunai for review, identifying that some 159,000m<sup>3</sup> of sanitary water had been removed to the municipal sewage works on 16.02.07.

#### **5.4.4. Air Emissions**

The only reported significant sources of atmospheric emissions are associated with the flaring of associated gas. Currently environmental payments are made for the specific volumes of substance emitted to the atmosphere, and a gas utilisation program is being undertaken in order to phase out the flaring of gas by 2009 in line with RoK legislative requirements (see Section 4.1.5 for further detail). Flaring operations occur at the site in line with the standards set by the Ministry of Environmental Protection.

#### **5.4.5. Materials Handling**

During the facility inspection all materials were noted to be stored in good order. The two bulk oil containers (2,000 and 3,000 m<sup>3</sup>) were observed to be equipped earthen bunding in accordance with minimum requirement under Kazakhstan regulations. Such bunding, particularly in association with permanent structures, would typically be of impermeable construction, for example such as concrete bunding with tank pit lining. Consequently, it is recommended that a contingent liability to the order of \$500,000 be considered for the construction of impermeable secondary containment in association with all hazardous materials storage vessels across the site.

#### **5.4.6. Deleterious Materials**

No significant ODS, ACM or PCBs are considered to be associated with the OTU due to the recent age of construction.

#### **5.4.7. Health & Safety / Fire Safety**

The OTU has state approval with respect to current regulatory requirements. The site is well laid out and all personnel were noted as wearing appropriate PPE. No incidents or accidents have occurred since the initiation of the OTU.

From the extent possible during a visual walk through site inspection the fire safety system appeared to be adequate and in a good state of maintenance, with dedicated firewater storage and foam production units and pump house.

The OTU and associated vessels were noted to be equipped with both visual and audible alarms. No telemetric alarms were present that would provide a remote warning of incidents occurring at the OTU. However 24 hour surveillance is reported to be in operation at the OTU.

The OTU includes a fire fighting system run on a high pressure pump with back-up diesel generator (Appendix E, Photo 20). A foam/water mix is distributed via a ring main to drench points around the facility capable of suppressing oil fires. All site personnel are trained in fire fighting drills, while select individuals within shifts are trained in additional fire fighting measures and rescue using on-site breathing apparatus. ZhaikMunai hold a contract with the local municipal fire service for provision of fire fighting services at the field.

The municipal fire station (Appendix E, Photo 23) is located in close proximity to the OTU. The fire station operates 27 personnel in shifts with two fire engines. Each shift includes 10 operational fire fighting personnel equipped with fire / heat resistant suits and breathing apparatus. The breathing apparatus include breathing apparatus with air canisters which would last 40 minutes of operational time.

It was noted that the fire station does not have a compressor capable of re-filling the air canisters; hence they are required to be re-filled in the town of Uralsk which is approximately 1 hr drive from the site. AMEC recommend that a compressor system is bought for the fire station to ensure that this would not become a life threatening issue should an accident occur requiring extended periods of breathing apparatus fire fighting time. This is estimated as a contingent cost of \$5,000.

### **5.5. Oil Pipeline (Under Construction)**

The Oil Pipeline is currently under construction. The state ecological expertise conclusion and approval for the project "Main pipeline from Chinarevskoye oilfield to Rostoshi Terminal" was reviewed by AMEC (doc; 1.5.a – 18.10.2006).

An area of recent reinstatement and ongoing recultivation was observed by AMEC during the site visits and appeared to be well re-instated. It should be borne in mind however that the pipeline construction phase has not yet reached completion and the infrastructure and state of recultivation has not been subject to a final regulatory inspection and approval. From the limited observations possible during the site visited, should the entire project be completed to the same standard as the areas observed by AMEC no obvious indications are known why regulated approval should be withheld. Photographs of the status of recultivation are presented in appendix E.

### **5.6. Demercaptanisation Unit (Under Construction)**

The planned demercaptanisation unit remain under the construction phase. The state of construction activities during the AMEC site visit were limited but appeared to be of a satisfactory standard. Photographs of the status of construction are presented in appendix E. The demercaptanisation unit is reportedly permitted and developed as part of the previously approved wider OTU project.

### **5.7. Oil Terminal (Under Initial Construction)**

The proposed location of the Oil terminal was not viewed during the site visit and it remains at a very early stage construction with no structures in place. The state ecological expertise and approval of the Terminal project (doc: 1.5.b. – 11.07.2007) was made available for review by ZhaikMunai.

## 6. Conclusions

### 6.1. *Environmental Key Issues*

The overall environmental status of the Chinarevskoye field and the level of environmental compliance of ZhaikMunai operations are considered to be of a high standard comparative to other similar operations in similar geographies and based on the experience of AMEC.

Whilst the history of exploration of the field dates back to the 1960s, all known historical wells have been de-commissioned and recultivated in accordance with RoK environmental requirements. The subsequent operational history of the field has been short and of a limited extent, as such no significant legacy issues or existing contamination was identified during the assessment.

Some potentially materials issues were identified in relation to current operational practices.

Volumes of gas flaring were noted to be in excess of permitted volumes during an MEP inspection. It is anticipated that a penalty to the order of \$2.6 million for this issue may be imposed by the regulator. As such a contingent provision to this order should be realised.

Furthermore, it is anticipated that without a reduction in production or an increase in permitted flaring volumes a further fine of \$2.6 million will be incurred for ongoing non-compliance with respect to this issue next year pending the completion of the first gas treatment unit in accordance with the gas utilisation programme. Consequently, it is recommended that a contingent liability be considered for such penalties.

During the same MEP inspection, a violation was also sited in accordance with lacking regulatory approvals for the practice of injecting waste process water to depth. Whilst ZhaikMunai is currently addressing this issue through the development of project plans for regulatory approval, it was reported that these plans may not be ready for submission by the 4<sup>th</sup> Quarter 2007 deadlines. Some contingent liability may be incurred in the form of levied penalties of cessation of operations. The exact extent of such a penalty is not known. It is considered likely that such a penalty, if incurred, would be material but not exceeding a level that might serious impact the viability of operations given that the activity is typical of other similar oil production operations and that necessary project plans for approval are currently under development.

Exploratory drilling practice employing drilling slurry pits to managed drilling arisings is compliant with current legislation and project approvals. However, in line with recent RoK legislation future exploratory drilling campaigns will be required to be "mud-pit free". Consequently an obligatory cost to the order of \$1.5 million should be realised for the provision of an adequate and approved drilling waste storage polygon. Such a polygon would typically be associated with four dedicated groundwater monitoring wells and a program of ongoing monitoring and waste management. ZhaikMunai anticipate that mud-pit free drilling will commence in 2008.

Furthermore, whilst the earthen bund construction of secondary containment across the site is compliant with the minimum RoK regulations, it is reasonable to assume that increasing legislative stringency will lead to requirements for secondary containment construction to come into line with current international best practice. Such best practice requires secondary containment to be of impermeable construction and of adequate capacity to contain 110% of that capacity of the largest vessel in the event of a spill. As such AMEC has identified a future contingent liability to the order of \$500,000 for the provision of impermeable secondary containment in line with best practice across the site.

Finally, ZhaikMunai holds government approvals from the Oblast Department of Justice for the project to relocate and compensate as necessary the inhabitants of the Rashcova village located within the Chinarevskoye field area to Uralsk. The company reports that some \$2.5 million has been allocated for the construction of a housing complex of 90 apartments and the relocation of the population. It was noted however that a further \$0.5 million should be recognised as a contingent liability to account for potential budgetary and schedule over-runs.

## **6.2. *Health & Safety Key Issues***

The health and safety assessment of the operations of ZhaikMunai LP conducted by AMEC found the operational activities to be undertaken to a high standard in comparison to similar activities and geographies:

No obligatory costs were found to be associated with the ZhaikMunai activities.

Throughout the assessment the following contingent cost was identified which is not an immediate regulatory requirement but would require expenditure as a matter of good practice:

- Provision of a breathing apparatus air canister re-charger for the fire station at the OTU – estimated cost \$5,000 (Section 5.4.7).

The health and safety permit status of ZhaikMunai was found to be compliant with the current activities undertaken as governed by Kazakh legislation specific to the oil and gas industry. The site inspections indicated a good standard of health and safety awareness and conduct in compliance with Kazakh operating standards.



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