

ENVIRONMENTAL MANAGEMENT

- ☑ ENVIRONMENTAL MANAGEMENT PLANS
- ☑ ENVIRONMENTAL HEALTH & SAFETY
- ISO14001
- ☑ OCCUPATIONAL HEALTH & SAFETY
PLANS - OHSAS 1800
- ANSI Z10
- ☑ WASTE MANAGEMENT PLANS
- ☑ EMERGENCY RESPONSE PLANS
- ☑ HSE RISK ASSESSMENT

About EcoSocio Analysts

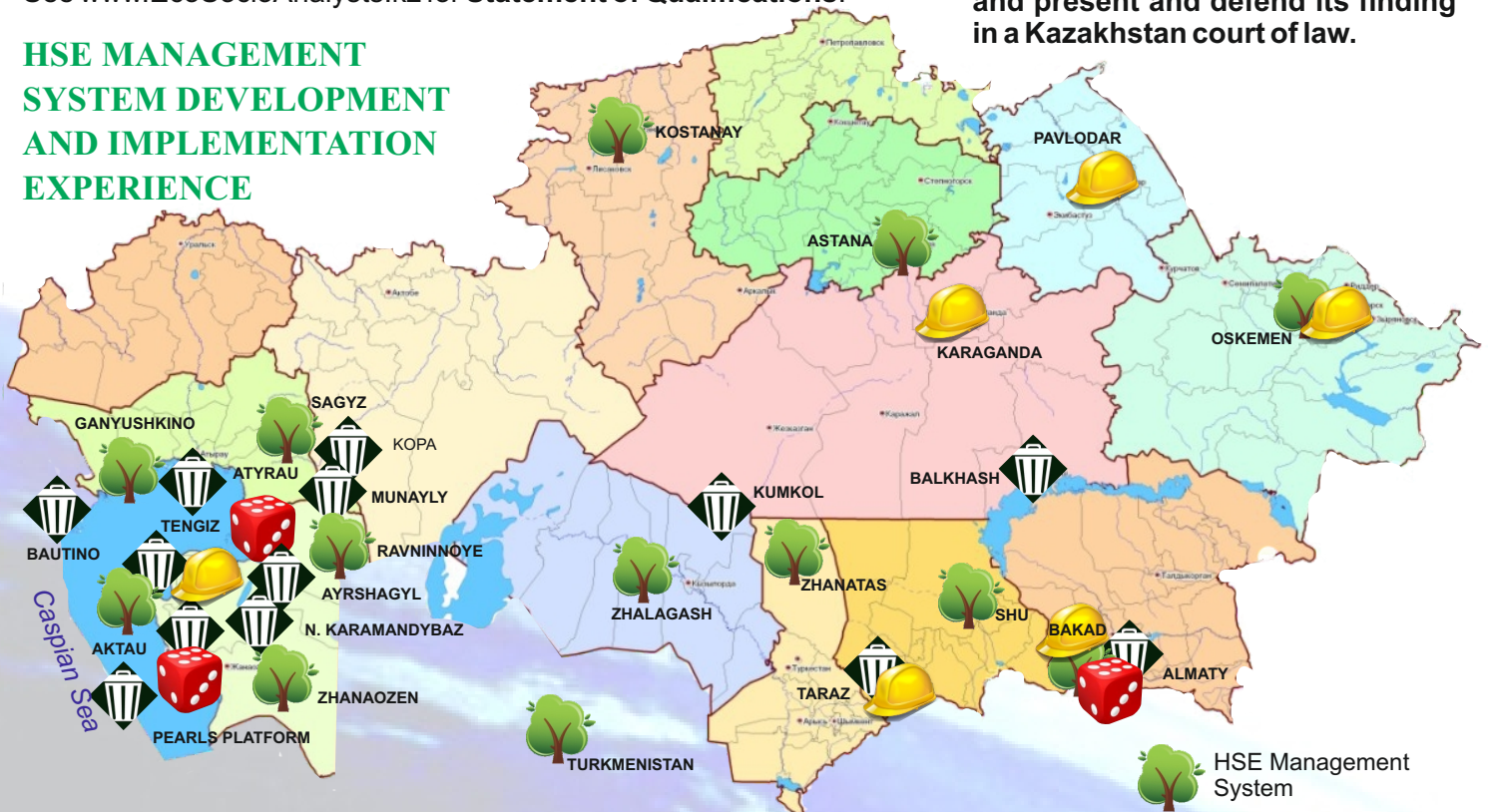
Established in 2014 EcoSocio Analysts LLC (ESA) is a successor of CaspiEcology Environmental Services formed in 2001. We provide full spectrum of health, safety, environmental and socioeconomic services including HSE due diligence, impact assessment, management systems and monitoring; stakeholder engagement, information disclosure, resettlement and livelihood restoration, contamination assessment, cleanup, revegetation and waste management. We communicate and produce reports in the required language be so the English, Russian or Kazakh.


Our blend of western education with local experience has allowed us to provide commendable work for the international lending organizations like the HSBC, EBRD and IFC and the companies that apply for their loans or for listing on the London Stock Exchange. When we lack specific experience for a project we join with our long-term partners from the UK, Germany, Italy, Spain and other countries as well as contract international free-lance experts. This allows us to accumulate experience in practically all industrial sectors present in Central Asia despite specialisation on the international investors.

See www.EcoSocioAnalysts.kz for **Statement of Qualifications**.

ESA is licensed to conduct audits and present and defend its finding in a Kazakhstan court of law.

HSE MANAGEMENT SYSTEM DEVELOPMENT AND IMPLEMENTATION EXPERIENCE



-  HSE Management System
-  Occupational H&S
-  Emergency Response
-  Waste Management
-  Risk Assessment

Implementation of an EMS is a **voluntary** approach to improving environmental performance. However, some aspects of the EMS may be required by local authorities, i.e. Environmental monitoring, waste management, community risk assessments, and emergency response capabilities. Thus, it is best to have control over the situation before any surprises pop up.

ESA staff have conducted 231 projects in various economic sections most of them according to the internationally recognised methodology: Oil & Gas (63); Energy (55); Transport (34); Property (35); Manufacturing (17); Infrastructure (12); Mining (12); Tourism (4); Agriculture (2) and Forestry. For the international financing organisations such as IFC, ADB, AIIB, HSBC and EBRD with its financial intermediates, it completed independently 2 Category A projects and 57 Category B projects and with the international partners managed the local part of 9 Category A projects and 21 Category B projects

DO YOU NEED AN EMS?

Yes, if:

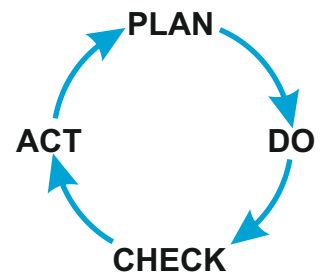
- 1) Your work is environmentally sensitive and is to be accepted internationally by e.g., the Asian Development Bank (ADB), the European Bank of Reconstruction and Development (EBRD), or the World Bank (WB),
- 2) You wish to be viewed as compatible with the international community.
- 3) You are required by the Kazakhstan Ecological Code of 9 Jan 2007 No. 212-III

WHAT IS AN EMS?

It is a way (a system) of managing a business to:

- Improve your level of environmental performance;
- Decrease your liability & problems, save money;
- Manage your environmental obligations better;
- Comply with laws and regulations;
- Clarify environmental goals and
- Comply with international environmental objectives.

It is based on the mitigation measures and monitoring requirements specified in your approved Environmental Impact Assessment (EIA). The purpose of an EMP is to ensure that all such measures and requirements are carried out from preconstruction through decommissioning. Data needs vary from project to project.



WHAT DOES AN EMS CONSIST OF?

Policies, plans with measurable objectives regularly updated standard operation procedures, required by legislation and lenders reporting etc.

WHAT ARE THE PRIMARY EMS DOCUMENTS BASED ON?

- 1) Environmental Management Plan
- 2) Health & Safety Plan
- 3) Environmental and Social Action Plan
- 4) Waste Management, Spill Response, Emergency Response plans etc.

WHEN DOES A COMPANY NEED AN EMS?

Normally at the beginning of the implementation stage, i.e., when you begin to build.

HOW DOES MY COMPANY ORGANIZE AN EMS?

- 1) Establish an environmental management office (EMO). This may consist of one person or more depending on the operation scale;
- 2) Contact an experienced (e.g., internationally accepted) environmental company to initially prepare the appropriate documents/plans and work with your EMO.

IS PREPARING AN EMS SYSTEM A BIG, COSTLY JOB?.

Review your EIA, see what measures and monitoring are required. EMS plans will need to be prepared to ensure these requirements are properly acted upon.

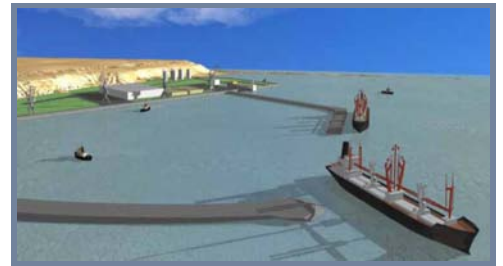
WILL I GET GOOD VALUE FROM PREPARING AN EMS?

Yes! It's very possible your company already has some of the required data, documents and processes and as proven by experience the EMS will save you money. The management system framework includes many elements that are common to managing many organizational processes, such as quality, health & safety, finance, or human resources. Integrating environmental management with other key organizational

EBRD STYLE EMS FOR A MARINE BASE CONSTRUCTION

Receptors	Environmental							Socioeconomic					
	Climate	Air Quality	Seawater Quality	Groundwater Quality	Bottom Sediments	Pollution, erosion and soil degradation	Impact on Fauna	Impact on vegetation	Impact on marine flora and fauna	Visual Impact	Discomfort in adjacent buildings	Local Economy	Health, Safety and Wellbeing of personnel
Construction Activity	Planned												
Base terminal components													
Breakwater and mooring													
Dredging													
Backfilling													
Material transportation													
Quarry development													
Seawater desalination													
Solid waste													
Wastewater													
	Emergencies												
Fire													
Explosion													
Hazardous material spills													
Fuel and oil storage spills													
Equipment fuel or oil spills													

Impact significance: High (Orange), Medium (Yellow), Low (Green), Positive (Blue)



Conceptual design of the Base

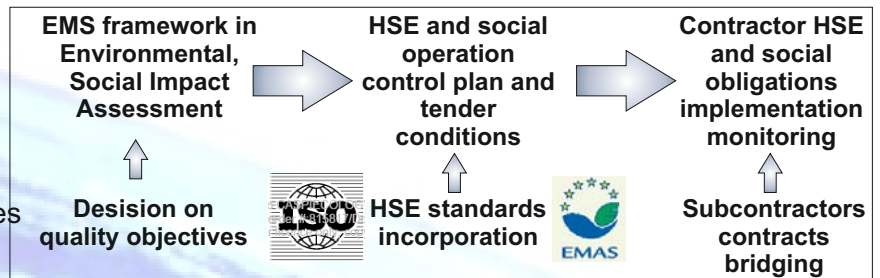


Bottom sediments contamination monitoring

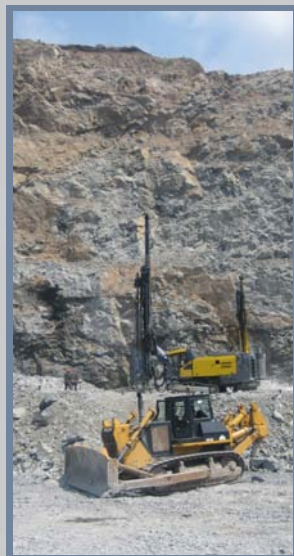
This ESIA impact matrix was used for preparation of the EMS framework

Planning comprised of the following:

- Environmental and Social Action Plan
- Environmental Operational Control Plan
- Occupational Health and Safety Plan
- Emergency Response Plan
- Waste Management Plan
- Hazardous Materials Handling Procedures
- Public Consultation and Disclosure Plan
- Resettlement Plan



ENVIRONMENTAL PERFORMANCE EVALUATION component of ISO 14031 was used to formally measure, analyse, report, and communicate the client's environmental performance against criteria set by its management.



Drilling for blasting

EBRD ESAP IMPLEMENTATION FOR A GOLD MINE

The gaps in environmental information was filled by assessing the mine impact on terrestrial and water plants and animals (including invertebrates) and the local community health, safety and security.

Then the project team prepared:

- Biodiversity remedial action plan,
- Workers and contractors housing strategy,
- Land acquisition and resettlement policy
- Retrenchment plan for transferring the operation from the open pit to underground.



Discussion of Resettlement Action Plan with effected households



The village, built to develop the mine back in 18th century, is now threatened by blasting rock

HSE & ER MANAGEMENT SYSTEMS FOR OIL FIELDS AND TERMINALS

HSE management systems were prepared for 4 oil fields and 2 oil terminals and implemented for 2 oil fields (Ozen, Ravninnoye).

The existing practises and the risks were assessed. The new HSE and ER plans were developed. The HSE and ER personnel was trained off-site courses and on-the-job in new work culture and practices. GIS was used in oil leakage prevention and response and data collection and incorporation procedures that accounted for local working culture and



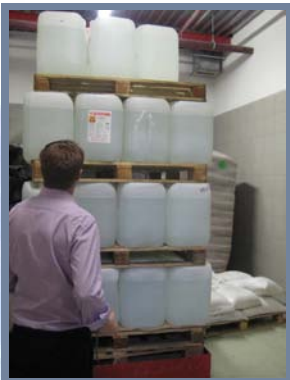
Thorough HSE and ER MS was required for tankrucks oil hauling along the Kopa River valley from Kopa Oil Field to Sagys Terminal

HSE PROCEDURES FOR CHEMICAL PLANT

After drafting ESAP for a polyaramid plant, ESA was asked to implement it by developing an HSE MS, which above all included the procedures on waste management, risk assessment, emergency response, hazardous material handling and storage and tanks cleaning.

EBRD ESAP IMPEMENTATION MONITORING

The project team helped Arup specialist prepare the ESAP implementation monitoring reports for 4 Beverage Producing Plants: Efes, Carlsberg, Coca-Cola and RG Brands (Pepsi-Cola).



WASTE MANAGEMENT PLANS

Waste management plans were prepared for existing HSE MS for Pearls Block Offshore Platform, Agip ER base area and an area or Kumkol Oil Field



Our Experience in Tourism

WORLD-CLASS MOUNTAIN RESORT AND SKI AREA

Kok Zhailau Ski Resort preEIA

As part of the international team of the mountain planners (**Ecosign**), civil engineers (**Arup**), economists (**Howath and KPMG**) and natural hazard management specialists (**Engineerisk**) ESA specialists participated in development of the resort master plan by providing environmental and social support and preparing preliminary EIA for this part of the National Nature Park. To evaluate alternatives for the project, the 420 km² and 6 other potential ski areas were studied.

The project was nominated for **2012 American Chamber of Commerce in Kazakhstan Environmental Health and Safety Award**



Natural hazards were accounted and managed

Examining Lift 11 top terminal slopes at 3430m

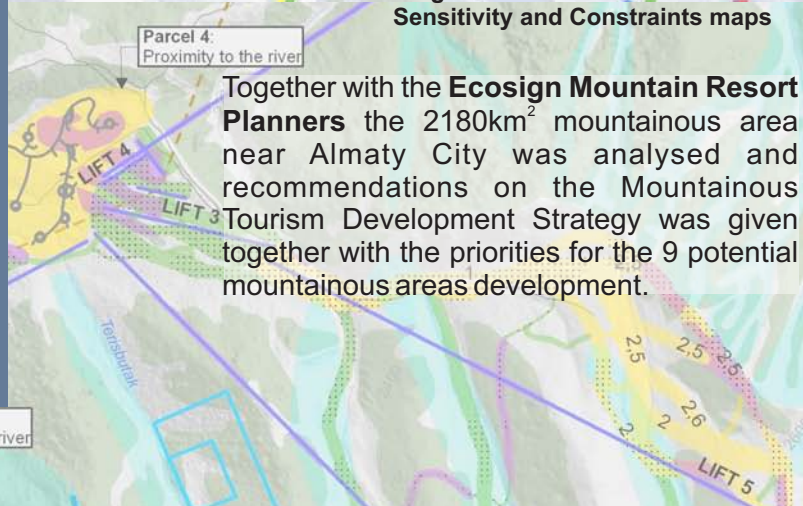


Almaty Ski Tourism Development Strategy

Big Almaty Lake area was attractive for development but had significant environmental constraints



Fragments of Environmental Sensitivity and Constraints maps



Together with the **Ecosign Mountain Resort Planners** the 2180km² mountainous area near Almaty City was analysed and recommendations on the Mountainous Tourism Development Strategy was given together with the priorities for the 9 potential mountainous areas development.

Medeo & Chimbulak ESIA & EMS

This world class project was designed to meet the standards of international tourism, the 2011 Asian Winter Games and, in perspective, the Winter Olympics. For this reason, the environmental and social sustainability aspects of the project were given top priority. The project team worked in close interface with highly respected international architects (**HOK, RAMSA**), engineers (**Arup, KINETIC**), mountain planners (**Ecosign**), transport specialists (**Colin Buchanan, Doppelmayer**), and business consultants (**Coilers International, Locum Consulting, Landbase Development and Interbrand**) to provide environmental and social support during detailed design and prepare ESIA report.



The design accepted the internationally recognised sustainability standards

INDUSTRY AT CASPIAN SEA

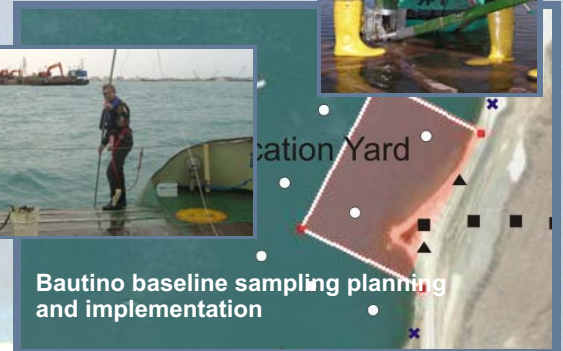


ExxonMobil Offshore Drilling Rig Study of Effluents Quality and Reuse/Disposal Options, 2010-2011



AGIP North Caspian Base EIA, Contamination Assessment, 2002

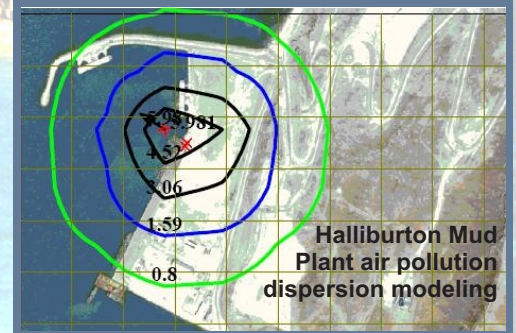
Atash Marine Base ESIA, EMS, Monitoring, Compliance, Resettlement to EBRD standards 2007-2010



McDermott Bautino Fabrication Yard EIA, 2010

Halliburton Mud Plant Pre EIA and EIA, 2008-2009

Caspian Sea Shore Impact and Sensitivity Study 2002



AGIP On-shore and Off-shore Monitoring 2003-2007

Kultuk Oil Field Development Legislation Review 2008

BMG Ayrshagyl Oil Field Contamination Assessment 2010



Mangystau Oblast Boat Yard (MOBY) ES audit and analysis 2008-2011 Monitoring to EBRD Standards



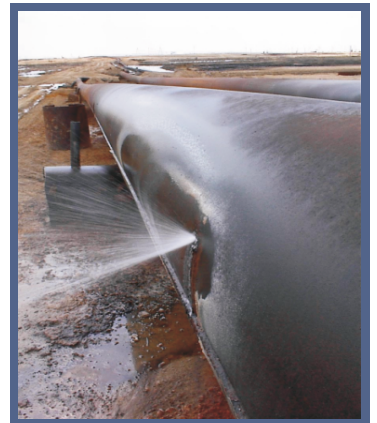
Health, Safety, and Emergency Response

international developments have verified that it is economically viable to create and maintain a good health and safety (HS), and emergency response (ER) culture in the working place. This consideration can't be achieved through compliance with RoK legislation alone but requires the establishment of a behavioral safety mentality. In short, a "from bottom-up" approach in which all concerned parties are involved in eliminating potential unsafe behaviors and activities. EcoSocio Analysts' approach in this respect is to improve employee's perceptions through training and awareness improvement programs.



As part of our objective, we identify particular workflow processes that may inadvertently lead people to behave unsafely and/or be subjected to unsafe practices.

We incorporate our approach into our client's policies, plans, and programs to ensure workable results are obtained that are in keeping with the client's wishes.

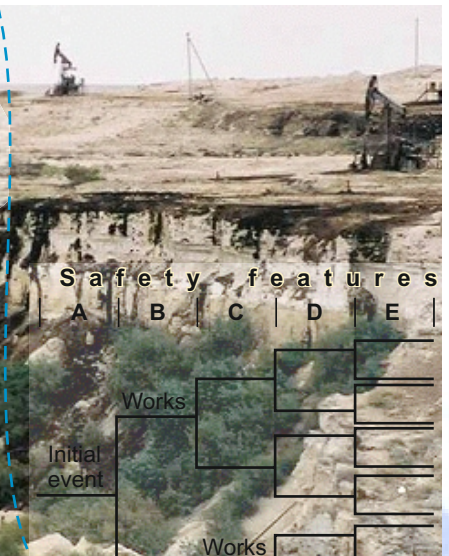
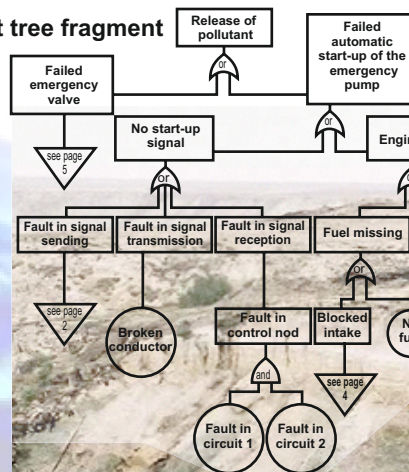


SPECIFIC SERVICES

- HS and ER audit and performance review
- Risk assessment (e.g. event trees and fault trees development)
- HS and ER plans development or recommendations for improvement
- HS and ER training and awareness improvement
- Supervision of implementation of a Total Safety Culture



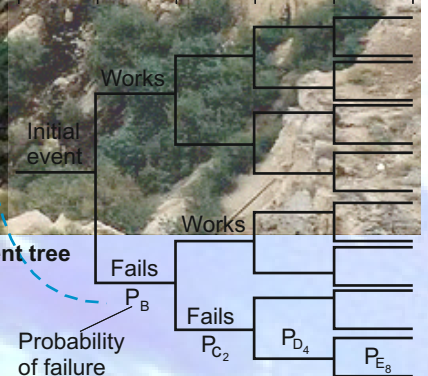
A fault tree fragment



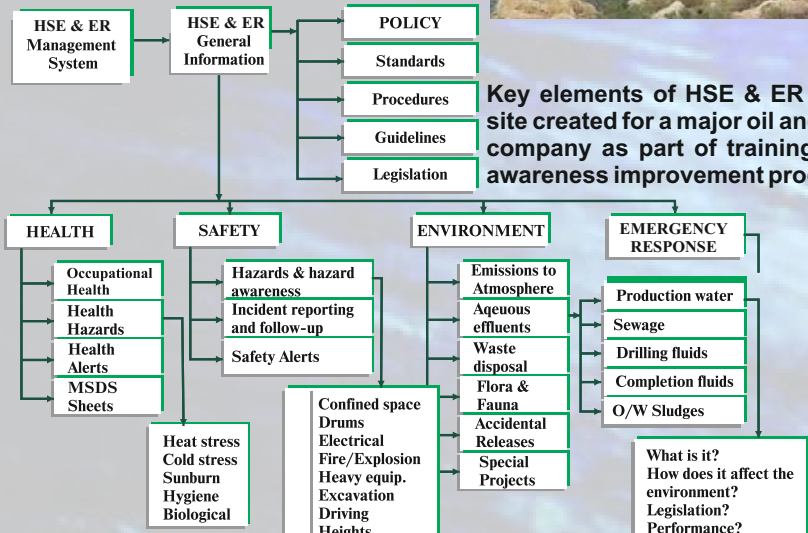
Safety features

A | B | C | D | E

Simplified event tree



Key elements of HSE & ER website created for a major oil and gas company as part of training and awareness improvement program



Client's Comment (Director of Asbestos Technology & Environmental Control Central Asia a member of ATEC Holdings Ltd.)
'Thank you for your updated information on HSE issues related to various aspects of asbestos identification and removal. I appreciate the teamwork we have developed and feel the RoK will approach our efforts in a most positive manner.'



EHS MS defines the methods used to plan, implement, assess, and continually improve its environmental management practices. This system is designed to meet the requirements of the ISO 14001:2004 (EHS MS - 2004) International Standard; referred to hereafter as ISO 14001. It is supported by several lower-tier documents including:

- Occupational Health and Safety System and Plan (ILO-OHS 2004, ANSI Z10:2005);
- Code of Conduct for Contractors (OHSAS18001:1999);
- Standard Operating Procedures (SOPs);
- Work instructions;
- Records; and
- Other relevant documents.

PLAN, DO, CHECK, ACT (PDCA) PRINCIPLE

Currently, all ISO 14000 series standards as well as the new American ANSI Z10, Occupational Health and Safety, are based on the model using the PDCA approach (Plan, Do, Check, Act). The European Standard, (EC) no. 761/2001, Eco-Management and Audit Scheme (EMAS), uses the same format and is also fully compatible with the other systems as of July 2006 under ruling (EC) 196/2006.



Training

Planning and Response

Even when all reasonable measures to prevent a chemical release have been taken, the risk or probability of a release occurring is not zero. Therefore, a prudent management practice is to anticipate that an emergency may occur eventually and to plan for it. A well-developed and implemented emergency plan can minimize loss and help protect people, property, and the environment.

To accomplish this requires planned procedures, clearly understood responsibilities, designated and accepted authority and accountability, and trained and drilled people. When an emergency occurs, it will be too late to plan, so it must be done ahead of time based on the kinds of emergencies that might occur.



Safety Poster used for training at Sagyz Oil terminal



Assessment of risk of oil hauling by trucks to the railway terminal along the Sagyz River Valley



Worker exposure to asbestos during a gas compressor station shop demolition



Health risk from increased air pollution from a power station expansion

Assessment of risk to residents from the Ganyushkino oil terminal expansion



Risk of leakage from abandoned oil wells near the Caspian Sea

Tengiz Transportation Company: Risk Assessment on hazards of transporting products from Tengiz oil field to Europe in railroad tankers



Rating	CONSEQUENCE				PROBABILITY					
	People	Assets	Environment	Image	A	B	C	D	E	
0	None	None	None	None	Never heard of in the world	Heard of incident in industry	Incident has occurred in our company	Happens several times/ year in company	Happens several times/ year at location	I
1	Slight	Slight	Slight	Slight	I	I	I	I	I	I
2	Minor	Minor	Minor	Minor	I	I	I	II	II	II
3	Major	Local	Localized	Considerable	I	I	II	II	III	III
4	1-3 deaths	Major	Major	Major national	I	II	II	III	III	III
5	Many deaths	Extensive	Massive	Major international	II	II	III	III	III	III

I	Manage for Continuous Improvement
II	Incorporate risk reduction measures
III	Intolerable

Risk Assessment Matrix was utilised from The Occupational Environment: Its Evaluation, Control, and Management. Second Edition. S.R. DiNardi, 2004. American Industrial Hygiene Association, Fairfax, Virginia.

Assessment of risk from Environmental Regulations for EBRD and PriceWaterhouseCoopers, 2002. The work that focused on environmentally related risks for banks and other investors was used for capacity building and technical assistance to three major Kazakhstan banks that were reviewed by EBRD as potential clients. **Client Comment:** "...very pleased with legislative review you did..." Project Manager

Assessment of Risk of Propane and Butane Transportation in Railway Tanks for Tengiz Transportation Company, (2002). Risk Assessment was performed to secure the loan from Kazakhstan Development Bank for purchase of 300 railway tanks, to transport propane and butane from Tengiz oil field to Kazakhstan, former Soviet Union and Eastern Europe. Environmental risk assessment of the tanks use and decommissioning was carried out with respect to the transported gases characteristics, existing operation procedures as well as the accident statistic data for the railways planned for use.

Client Comments

European Bank for Reconstruction and Development

EBRD (Senior environmental advisor)

- 1) *What a heroic effort turning this around so quickly, thanks!!*
- 2) *"...As a result of our meeting, the references you sent about the experts and my review of the Atash Marine Base EIA. I can say there will not be a need for a Gap Analysis by an external party."*
- 3) *"I am very pleased to hear that you will be monitoring the project implementation. As I have always said I had been very pleased with the quality of your work and your cooperation during the EDD. I hope our close relation will continue during the implementation stage."*
- 4) *"I reviewed the Resettlement Action Plan... you have done a very good job on it!!".!*
- 5) *"The overall quality of the work done is very good. Nicely written in a concise manner, but without omitting important details."*



Ministry of Environmental Protection Office, Kyzyl Orda (Head of the State Environmental Expertise)

*"We would like to note the high professionalism and quality of the project and analytical data of the prepared **cleanup and recultivation plan**. The*

*cleanup methods screening, accounting for all positive and negative aspects and the cost-benefit analysis for each screened method particularly impressed me. I hope that the **diligence and professionalism of your specialists will serve for the welfare of our Republic** and the health of the people of Kazakhstan. Thank you."*

Regional Center in Central Asia (CAREC) (Director)



*"...thanks for your cooperation and support of sub-regional seminar on **"Strengthening of the Central Asia countries potential in the Assessment of Environmental Impact in transboundary context"**. Your contribution has made the seminar useful in a practical manner.*



Price-WaterhouseCoopers (Project Manager)
*"... very pleased with **Assessment of Risk from Environmental Regulations** you did..."* The work was used for technical assistance to three major Kazakhstan banks that were reviewed by EBRD as financial intermediary.



Datoba Construction Datoba Construction LLP (Director)

*"We appreciate the special effort you put into its work, its ability to communicate and respond to the particularly demanding issues associated with construction work. Datoba is **happy to include you in all our related work** from extensive **high-level international projects for companies like McDermott and Halliburton** to projects associated with local construction firms and related laws and regulation of Kazakhstan."*



ILF GmbH (Senior Consultant)
*"Thank you for the fine preEIA for the **Crude Oil Pipeline Kenkiyak-Atyrau** (which) is very **impressive** with special regards to the data collected, the evaluation of the results... and the professional interpretation and handling of the environmental issues addresses. To **accomplish** such work in the **short period** available denotes the **highest praise**."*



THE World Bank (Lead Economist and Lead Energy Specialist)

*"...We appreciate the significant progress that has been made in a **pilot cleanup and oil recovery** (under the Uzen oil field rehabilitation project loan supported by the government of Kazakhstan) and note that it is in keeping with the Bank's policy of sustainable development and promotion of social development."*



Agip KCO OKIOC(Agip KCO) (HSE Manager Greg Cresswell)

*"... prepared for the **MENR the Review of the North Caspian Sea Exploration Project EIA** is a very constructive tool for implementing exploration drilling. Because of the **exceptional quality** and usefulness of this product, OKIOC accepts and commits to implement all your comments to improve the Project."*



UzenMunayGas (Environmental Project Coordinator)

*"Together with Ecology & Environment, Inc (USA) your team did a superior job in completing an **environmental audit** on a portion of the Uzenmunaigas oil field that was significantly complex in nature and contaminated from variety of sources. I understand the regional environmental authorities proclaimed it to be **'...the best environmental study they have ever seen'**. Professional work of this nature deserves to be complemented and I am happy to do so"*



ENVIRON Environ, UK (Senior Consultant)

*"I am very happy indeed with you helping in audit of **2 oil terminals, 2 oil fields and a chemical plant** and will always contact you when we get future projects in Kazakhstan... **EBRD sounds delighted** with our tenacity."*

ATKINS WS Atkins (Associate Water and Environment)

*"I would like to thank you for all your efforts in undertaking the **audit** and generating the report, which was **received very well by EBRD**. It was an **achievement to meet the very tight timescales** on this one."*



Roxi Petroleum (COO)

*"Great job! The **due diligence** reports you compiled on each of seven of our oil fields **met all requirements of the Alternate Investment***

***Market (AIM) as well as our investors**. The **ESIA** was equally **appreciated** by our team as is your oil field **microbiological remediation** efforts. We hope we can continue to work with you into the future."*

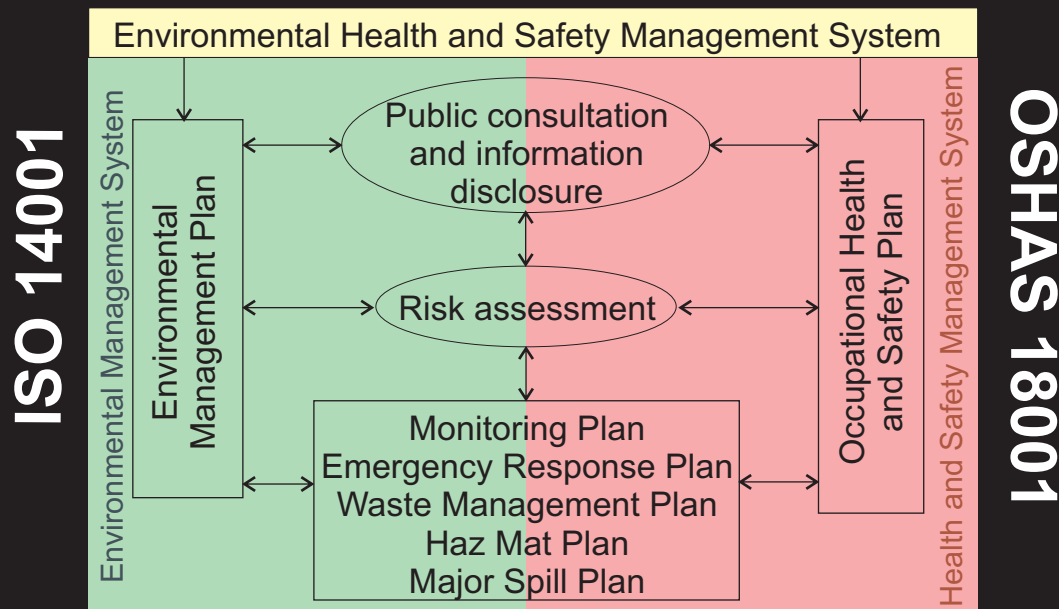


CASPIAN SERVICES INC. Balykshi, a subsidiary of Caspian Services (Director).

*"Thank you for providing continuous and **very reliable services** to our development company for the past two years. Your ability to solve problems, work with local people and organizations like the European Bank of Reconstruction and Development (EBRD) is commendable. We hope we will be able to work together for many years to come."*

**WHAT NEXT?
 Call us for a Consultation on
 ENVIRONMENTAL HEALTH
 AND SAFETY MANAGEMENT**

A comprehensive Management System should be designed to cover not only Worker Health and Safety, but Environmental Health and Safety as well. This requires an integrated system to meet international standards. Depending on your project and its size and scope, you may need some or all of the below components.



See www.EcoSocioAnalysts.kz for Statement of Qualifications and other brochures:

- Socioeconomic Assessment and Stakeholder Engagement
- Contamination Assessment and Remediation
- Monitoring, Surveys and Investigations
- Civil and Industrial Construction
- Energy and Energy Sources

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