EXECUTIVE SUMMARY

BACKGROUND AND METHODOLOGY

The Consortium led by Environmental Resource Management (ERM) Ltd and supported by Fideco d.o.o. and CSA Group Ltd was commissioned by the Privatisation Agency of the Republic of Serbia (PA), to undertake the "Environmental Assessment of the Environmental Damages from Past Operations of RTB Bor" in November 2005.

The Project is aimed at the preparation of an Environmental Assessment for RTB Bor operations including an assessment of environmental damages from past operations, determining the environmental issues and the required clean-up measures.

This document represents the Final Environmental Assessment Report for the study and presents the work undertaken in the frame of the Project by the Consultants, focusing on the description of Environmental Baseline, identification of Environmental Impacts deriving from Past and Current activities undertaken at the Complex and the proposed Environmental Management Plan (EMP).

The EMP includes an Action Plan with Mitigation Measures description and an Environmental Monitoring Plan. In addition, a list of Recommendations for the Institutional Strengthening and Legal Framework development is included in the report as part of the Legislative and Institutional Framework review reported in Annex C. Finally, the two steps consultation process is described by means of the two reports from the First and Final Local Consultation Meetings, reported in Annex E.

Adopted methodology for the environmental assessment included:

1. description of the environmental baseline through data collection and elaboration with regard to environmental setting and available monitoring data related to air, water, soil, public health, flora, fauna, rare or endangered species and sensitive habitats. The environmental baseline has been defined relying on data supplied by site management, municipalities, universities and other entities; no additional monitoring has been undertaken;

2. identification of pressure factors – in particular, analysis of the RTB Bor Complex through general data collection, site inspections, interviews with site management and local consultation process;

3. impact assessment through comparison of environmental data with Serbian regulatory requirements and WB/€U standards and gap analysis with regard to existing international standards of good practice management; an analysis of privatisation options/alternatives was undertaken to ascertain relation of the proposed privatisation/restructuring plan with the environment;

4. preparation of an Environmental Management Plan including: a) preliminary mitigation measures to be undertaken; mitigation measures have been qualitatively prioritised based on an "urgency criterion"; b) preparation of an Environmental Monitoring Plan with the aim of completing environmental data collection and of verifying effectiveness of mitigation measures.
SITE DESCRIPTION

RTB Bor Complex includes:

- RBB copper mines in Bor, comprising:
  - Bor Mines (open pit and Jama underground mine) and Concentrator;
  - Veliki Krivelj Mines and Concentrator;
  - Cerovo Mine and Mill;
  - RBM Copper Mine in Majdanpek;
  - TIR Copper Smelter and Refinery Bor.

RBB Bor and TIR smelter complex are located in the Bor District around the municipality of Bor, approximately 160 km far from Belgrade and 20 km from Zajecar. RBM Copper Mine is located close to the Bulgarian and Romanian borders, approximately 210 km far from Belgrade and about 40 km north-east of Bor settlement, south of Majdanpek village and at a distance of about 15 km from the Danube.

The sites were first developed at the beginning of 1900 for copper ore exploitation. The site is presently involved in copper ore drilling, crushing, milling and flotation (at Bor, Veliki Krivelj and Majdanpek) for subsequent smelting and refinery of copper in the TIR plant of Bor. Activities are currently decreasing due to reduced content of copper in the ore and lack of investments and maintenance due to economic difficulties of the Complex.

PRIVATISATION AND RESTRUCTURING OF RTB BOR

It is currently ongoing a Project “Restructuring and Privatization of RTB Bor” which encompasses RTB Bor (Parent Company), RB Bor (RBB), RB Majdanpek (RBM) and Smelter and Refinery (TIR). The consortium in charge of the Project on behalf of the Privatization Agency of the Republic of Serbia (“PA”) is constituted by CA IB, Deloitte, Harrisons Solicitors and the subcontracted IMC.

After thorough consideration of various options, Sale of Assets has been recommended as the most appropriate privatization/restructuring method. The subject recommendation was made upon the cross-assessment of the social, financial and legal implications, as well as the expressed market interest. Special consideration was given to the required time for the implementation of each possible option, and the Sale of Assets is obviously the fastest method.

The Consortium anticipates that the assets will be sold as part of the following groups:

- RBB core assets;
- Veliki Krivelj, flotation and Cerovo assets; Jama assets (including Borska Reka deposit) and flotation;
- TIR core assets;
- RBM core assets.

The structure and time frame of the sale process will be presented in the Action plan, which will encompass specific activities, responsible parties and define project implementation deadlines. The outputs of the EA will be incorporated in the Action plan to include environmental liabilities in the Sale process.
ENVIRONMENTAL IMPACTS

Main environmental issues identified at the sites are reported in the following paragraphs grouped by impacted media (air, wastewater, waste, soil and groundwater).

Meteorology and Air Quality

Bor and its surroundings are characterised by continental climate. Prevailing winds are from WNW but also from east. Winds from North and South are practically absent.

With regard to air quality, current monitoring is undertaken by means of four stations: Gradski-Park, approximately 500 m E from the smelter stack; Copper Institute, about 1 km SW from the smelter complex; Electroistok Yugopetrol, about 2 km SE of the smelter and Brezonik, a community about 2.5 km N of the smelter. Key data with regard to air quality are reported in the following Table:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Location of sampling point</th>
<th>Emission detected* (µg/m³)</th>
<th>Serbian limits* (µg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>particulate</td>
<td>Copper Institute</td>
<td>10 (max 63)</td>
<td>50</td>
</tr>
<tr>
<td>sulphur dioxide</td>
<td>Electroistok Yugopetrol</td>
<td>126 (max 1,508)</td>
<td>50</td>
</tr>
<tr>
<td>arsenic</td>
<td>all stations</td>
<td>ranging between 4,5-224</td>
<td>6</td>
</tr>
</tbody>
</table>

* annual average

Also Majdanpek climate is of continental type. Prevailing winds are from ENE and W.

With regard to air quality in Majdanpek, no recent monitoring data are available. In the past, air quality in the region was found to have been mainly affected by particulate.

Air emissions

Major emission sources in Bor area are recognised to consist of stacks from the TIR smelting complex which have high emissions of sulphur dioxide (annual average concentrations in 2004 up to 16,000 mg/Nm³ against a limit of 2,000 mg/Nm³) and particulate (annual average concentrations in 2004 up to 1,200 mg/Nm³ against a limit of 20 mg/Nm³). Additional sources of emissions to air include: sulphur dioxide and particulate from power plants, particulate from mining activities both underground and crushing/milling processes, wind blown particulate from tailing ponds and spoil heaps.

Major emission sources in Majdanpek are recognised to consist of particulate from RBM mining activities due to crushing/milling processes and wind blown particulate from tailing ponds and spoil heaps.
Surface Water Quality

Monitoring activities in the vicinity of Bor Complex in Timok, Bor, Kriveliska and Bela rivers have been carried out in recent years. Several exceedings of Serbian for heavy metals (mainly copper and nickel) and suspended solids were recorded in Bor, Kriveliska and Bela rivers (copper concentrations up to 16 mg/l against a limit of 0.1 mg/l). Also in Majdanpek were carried out analysis of Mali Pek and Veliki Pek rivers and exceedings of suspended particles, iron and copper were recorded.

This situation is mainly derived by the leaching of waste and overburden heaps located in the Bor area and by RBB and TIR liquid effluents discharge.

Wastewater Discharges

With regard to wastewater effluents generated at Bor, main sources of wastewaters include effluents from underground mine (blue waters) and drainage waters collected at the bottom of open pits (Bor, Veliki Krivelj and Cerovo), wastewaters from the smelting complex comprising sulphuric acid plant WW, spent electrolyte solutions and blowdowns; runoff from overburden disposal sites and waste heaps leaching.

Major effluents generated are reported in the following Figure:

Figure E.1 Wastewater Effluents Generated at Bor
3: Effluents from Jama underground mine (blue water)
4: Drainage waters from the tailing dam 1A
5: Drainage waters from the tailing dam 3A
6: Wastewater from lake Robule, collecting stormwater runoff from overburden disposal sites
7: Mixed effluents including drainage water from open pit Bor and from smelter

Based on analytical results of monitoring undertaken on the generated effluents in 2005, presence of concentrations above Serbian limits of heavy metals (Cu, As, Zn, Fe and Ni above Serbian limits) and highly acidic pH are detected.

With regard to wastewater effluents generated at Majdanpek, main sources of wastewaters are limited to mining activities - drainage waters collected in open pits (North and South) and runoff from overburden disposal sites and waste heaps leaching which are currently not monitored. Minor effluents include water from filtration of tailings and wastewater from the light workshop and heavy service.

**Waste Management**

Main waste generated at Bor include overburden and tailings from mining activities, slags from blast furnace and insulating materials from the smelting process and other wastes including waste tyres, scrap metals, lubricating oils and spent accumulators. Waste generated at Bor are currently mainly open dumped.

Major open dumps are recognised to be present at Bor site, close to the tailing pond RTH and in the old open pit Bor. In addition, an open dump for municipal waste is located on the premises.

Main waste generated at Majdanpek are overburden and tailings from mining activities and other wastes including waste tyres, scrap metals, lubricating oils and spent accumulators.

Waste are stored at different locations throughout the sites. No formal waste management procedures are in place at the sites and waste generated are generally on site temporarily stored waiting to be re-used or sold out or on site dumped.

Based on available information and interviews conducted at the site, waste have historically been on site abandoned/dumped and the same procedure is currently in place with the exception of secondary raw materials that can be sold or reused at the site (metal scraps, redundant equipment, spent batteries, exhausted oils). Waste are generally placed directly on the ground, without any soil protection devices and any mitigation measures to avoid stormwater runoff contamination and fugitive emissions to air of dusts and vapours.

**Soil, Groundwater and River Sediments**

Quality of soil, groundwater and river sediments

Controls have been carried out on drinking water wells and no significant quality problem was identified so far. On the contrary, no sufficient information is available about the quality of first aquifer; further monitoring is needed. Only few soil quality measurements have been undertaken in Bor vicinity. Only copper resulted in some samples above Serbian limits. River sediments taken from the Bor and Kriveliska
rivers resulted to be highly polluted: copper concentration was found to reach 3,000 mg/kg and arsenic concentration up to 300 mg/kg.

Sources of Contamination

Key identified sources of soil and groundwater contamination at Bor include:

- wet/dry deposition of air pollutants deriving from the smelter and dusts from tailing ponds, open dumps and waste heaps;
- historical and current waste dumping and contaminated stormwater infiltration into the ground and leakage from the underground pipeline connecting Cerovo open pit to Bor;
- historical and current discharge of contaminated effluents into surface watercourses and consequent sediments contamination.

Key identified sources of soil and groundwater contamination at Majdanpek include:

- wet/dry deposition of particulate from tailing ponds;
- historical and current discharge of contaminated effluents into surface watercourses and consequent sediments contamination.

ENVIRONMENTAL MANAGEMENT PLAN

Mitigation Measures

Air Quality and Emission to Atmosphere

With regard to Bor, main recommended mitigation measures include smelter modernisation plan or closure (as recommended also by the specific SNC Lavalin study), power plant to be equipped with electrofilters rather than with cyclones, revegetation of tailing ponds to abate particulate dispersion and crushing/milling plants to be fitted with ventilation/particulate abatement devices.

With regard to Majdanpek, main recommended mitigation measures include revegetation of tailing ponds to abate particulate dispersion and crushing/milling plant to be fitted with ventilation/particulate abatement devices.

Wastewater effluents

With regard to Bor, major mitigation measures to be implemented include:

- chemical-physical wastewater treatment to be provided prior to discharge into surface water of effluents from Jama and from the smelter;
- treatment of drainage water collected in the open pits and final rehabilitation of the pits; and
- treatment of leachates from spoil heaps and overburden and final requalification of waste heaps.

With regard to Majdanpek, proposed mitigation measures are limited to the evaluation of the opportunity of recycling the effluents from the filtration process and crushing into the flotation. This option has to be ascertained, since provision of a dedicated treatment plant is considered not economically sustainable. Based on results of monitoring of drainage water collected in the open pits and of leachates from spoil
heaps and overburden (to be analysed for acidity, heavy metals including arsenic), need of treatment should be assessed.

Waste Management

Recommended Mitigation Measures at both sites consist of:

- Future Waste Generation - open dumping of waste must be stopped and an adequate temporary storage area should be provided;
- Existing solid waste - open dumps have to be immediately secured; an inventory of dumped waste and related risk assessment must be undertaken; waste capping/removal to be carried out.

Soil and Groundwater Contamination

Due to the lack of detailed geological and hydrogeological data and comprehensive soil and groundwater quality information, no soil remediation can be recommended at this stage except for the replacement/repair of Cerovo-Bor underground pipeline.

The environmental setting has been severely influenced by historical mining activities which deeply impacted geology, hydrogeology and hydrology. This aspect makes very complicated any identification of environmental impact with specific regard to soil and groundwater aspects. In addition, many environmental data are available, but there is a lack of some key data e.g. adequate topographical maps, geological and hydrogeological sections. In summary, although some soil and presumable shallow groundwater contamination is likely to have been occurred, the high level of uncertainty does not allow at this stage to propose any soil remediation before appropriate soil monitoring is undertaken.

Prioritisation of Mitigation Measures

The Privatisation and Restructuring Program poses a number of technical issues but also a high level of uncertainty in the environmental data of which the assessment had to take into account in the process of issues description and mitigation measures/clean up interventions identification in one of the most polluted areas in this part of Europe.

From a qualitative point of view, it can be pointed out that the key issues at the complex are the very bad quality of air, which need urgently an intervention (closure of air polluting sources - mainly identified in the smelting complex - or modernisation of this plant) and the discharge of untreated effluents from mining activities, characterised by acidic pH and high content of heavy metals, into surface watercourses, which requires installation of adequate wastewater treatment plants and/or prevention of generation of these effluents by means of modelling and revegetation of open pits and overburden heaps. In addition to these two aspects, it is anticipated that soil and groundwater contamination may pose an additional, severe risk, that can not be quantified at this stage due to a general lack of data.

Due to the fact that the situation is so complex, a phased approach is proposed by the Consultants focusing on realistic, gradual interventions to be prioritised by means of an urgency criterion. In particular, identified environmental issues have been classified as immediate or chronical high risk issues both with regard to the people and the environment.
According to this approach, the following criteria have been adopted for prioritisation:

- Immediate, high risk issues both with regard to the people and the environment have been classified as priority 1.
- Chronical high risk issues have been classified as priority 1, 2 or 3 based on gravity of consequences:
  Priority 1 - Immediate, high risk issues both with regard to the people and the environment and chronical high risk issues that pose a real, actual threat with regard to the people;
  Priority 2 - Chronical high risk issues with regard to the environment;
  Priority 3 - Chronical high risk issues mainly related to environmental liabilities

A summary of main proposed Mitigation Measures with assigned priority is reported in the following table.
### Table E.2 Prioritisation of Proposed Mitigation Measures

<table>
<thead>
<tr>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bor</td>
<td>smaller modernisation plan (different options) or closure</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>revegetation of tailing ponds and spoil heaps</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>crushing/milling plants to be fitted with ventilation/particulate abatement devices</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>power plant to be equipped with electrofilters</td>
<td>2</td>
</tr>
<tr>
<td><strong>Majdanpek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>crushing/milling plants to be fitted with ventilation/particulate abatement devices</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>revegetation of tailing ponds and spoil heaps</td>
<td>1</td>
</tr>
<tr>
<td><strong>Waste-water effluents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bor</td>
<td>chemical-physical wastewater treatment to be provided prior to discharge into surface water courses of effluents from jams and from the smelter</td>
<td>2*</td>
</tr>
<tr>
<td></td>
<td>treatment of drainage water collected in the open pits and final rehabilitation of the pits</td>
<td>2*</td>
</tr>
<tr>
<td></td>
<td>treatment of leachates from spoil heaps and overburden and final requalification of waste heaps</td>
<td>2*</td>
</tr>
<tr>
<td><strong>Majdanpek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the opportunity of recycling the effluents from the filtration process and crushing into the flotation should be ascertained since provision of a dedicated treatment plant is considered not economically sustainable.</td>
<td>2*</td>
</tr>
<tr>
<td></td>
<td>based on results of monitoring of drainage water collected in the open pits and of leachates from spoil heaps and overburden (to be analysed for acidity, heavy metals including arsenic), need of treatment should be assessed</td>
<td>2*</td>
</tr>
<tr>
<td><strong>Waste</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bor</td>
<td>Future Waste Generation - open dumping of waste must be stopped and an adequate temporary storage area should be provided</td>
<td>3**</td>
</tr>
<tr>
<td></td>
<td>Existing solid waste - Open dumps have to be immediately secured; an inventory of dumped waste and related risk assessment must be undertaken; waste capping/removal to be carried out</td>
<td>3**</td>
</tr>
<tr>
<td><strong>Majdanpek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Future Waste Generation - open dumping of waste must be stopped and an adequate temporary storage area should be provided</td>
<td>3**</td>
</tr>
<tr>
<td></td>
<td>Existing solid waste - Open dumps have to be immediately secured; an inventory of dumped waste and related risk assessment must be undertaken; waste capping/removal to be carried out</td>
<td>3**</td>
</tr>
<tr>
<td><strong>Soil Quality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bor</td>
<td>A site-specific survey should be undertaken at all open pits including data review, monitoring wells and boreholes drilling, core logs preparation, fractometry elaboration and reporting</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Surface soil sampling in an area of 5 km around the smelter - 80 sampling points individuated by concentric rings and radial vectors</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Soil monitoring plan in the open dumps area with a 20x20 grid</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>River sediments' sampling every 250 m on the two banks</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Urgent replacement of the underground pipeline from Cerovo to Bor</td>
<td>1</td>
</tr>
<tr>
<td><strong>Majdanpek</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A site-specific survey should be undertaken at all open pits including data review, monitoring wells and boreholes drilling, core logs preparation, fractometry elaboration and reporting</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Surface soil sampling in an area of 2 km downwind the tailing ponds in the prevailing wind direction - about 40 sampling points individuated by radial vectors</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>River sediments' sampling upstream and downstream discharge points</td>
<td>1</td>
</tr>
<tr>
<td><strong>Tailing ponds</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bor</td>
<td>Stability analysis to be performed at all tailing ponds in Bor and Majdanpek including geotechnical investigation, new piezometers installations and stability evaluation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Urgent measures e.g. seepage containment and silt wash containment</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Final rehabilitation of tailing ponds including side slopes and flat surface and revegetation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Underground collector beneath Veliki Krivelj tailing ponds needs urgent intervention as already stated in a number of studies</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Bor collector needs remedial work analysis and design of potential options for intervention</td>
<td>1</td>
</tr>
</tbody>
</table>

* Assuming there is no connection with drinking water network
** Assuming that risk assessment results will not evidence any threat with regard to the environment or human health
Environmental Monitoring Plan

A proposed Environmental Monitoring Plan (EMP) for the RTB Bor Complex has been developed with the aim to:

- acquire new elements to complete the environmental data collection;
- provide an outline of a tool which will help to monitor the environmental data and the implementation and the efficiency of the proposed environmental mitigation measures.

To achieve the above specified objectives, it is proposed to appoint an Environmental Advisory Committee (EAC), gathering a group of highly qualified experts, which will have the duty to guarantee the implementation of the proposed mitigation measures and monitoring activities, interpret monitoring results and suggest possible corrective measures.

The EAC could be formed by:

- one representative of the Municipality;
- one representative of the Privatisation Agency;
- the new owner(s);
- one representative of the Ministry for the Environment;
- one representative of NGOs;
- representatives of local communities.

The need for two separate EACs for Bor and Majdanpek should be considered. Environmental problems are quite different at the two sites and new owners might have different attitudes and environmental sensitivity.

One of the tasks of the EAC will be also to review the authority and capability of institutions at local, provincial/regional and national levels and recommend steps to strengthen or expand them so that the monitoring plan can be implemented. The recommendations may extend to new laws and regulations, new agencies or agency functions, intersectional arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support.

Upon being formed, the EAC will begin an environmental monitoring training program for institutions, population and stakeholders on how to convey the importance of the monitoring plan, its goals and how their contribution and commitment could improve the success of the plan itself. Once a year, the EAC will arrange a public conference and present results and progress. Finally, the EAC will be responsible of public access to environmental data.

Monitoring Program

A 5 year monitoring program is to be developed and implemented, starting from the privatization process. This will allow for the establishment of background data and comparison of impacts before and after mitigation measures implementation.

The following monitoring activities are proposed:
Air Quality

- continuous monitoring of air emissions from main stacks. Emissions of SO₂, particulate (including PM₁₀) and NOₓ from the four main stacks (roasting furnace, smelting furnace, sulphuric acid plant and power plant) should be monitored on a continuous basis;
- spot sampling of air emissions. Quarterly monitoring is proposed at the four main stacks to investigate the chemical composition of particulate for heavy metals contents. In addition, emissions of SO₂, particulate (also for heavy metals) and NOₓ from the other RBB, TIR and RBM stacks will be monitored every three months;
- air quality in the Bor District. An integral ambient air quality monitoring system is foreseen for SO₂, particulate (including fine particulate - PM₁₀) and NOₓ. Pollutants concentration will be monitored on a continuous basis and every three months the chemical composition of particulate will be also investigated for heavy metals contents. With regard to the Bor Municipality, since four monitoring stations are already present, it is proposed to install 1-2 new ones. In addition, equipment for all the stations (existing and new) with fine particulate (PM₁₀) monitoring devices is recommended. With regard to the Majdanpek Municipality, since no monitoring stations are present, it is proposed to install at least one for particulate monitoring.
- air immissions in Bor and Majdanpek, up wind and down wind from tailing ponds and reclamation areas. Immissions of particulate (including PM₁₀) will be monitored on a continuous basis by means of dedicated monitoring stations to be installed upwind and downwind to each tailing pond, along the prevailing wind direction. Once a month, the chemical composition of particulate will be also investigated for heavy metals. Periodic reports will be issued (comparing the results with legislative limits) and sent to the Municipalities. A minimum of 8 monitoring stations are foreseen.

Wastewater

- flow rates monitoring. Flow rates of process water discharged will be monitored on a periodical/continuous basis in order to have reliable data for preliminary design of WWTP; the proposed survey will require close cooperation of water specialists with site personnel who should give specific input with regard to representativeness of data to be collected;
- effluents generated at Bor will be analysed before and after treatment to ascertain quality of effluents discharged and to monitor efficiency of WWTPs installed. Monitoring will be undertaken every three months, to ensure that all recorded parameters are in compliance with the legislative limits in force. The analysed parameters should be the following: pH, COD, TSS, metals including - as a minimum - Cu, Fe, Zn, As, Cd, Pb, Cr, Ni; standard water sampling equipment and laboratories are required;
- existing monitoring procedures in Majdanpek (quarterly) should be continued; in addition, it is suggested to monitor quality of water drainage from open pits and rainwater runoff from overburden disposal sites. Based on results of additional monitoring, (effluents to be analysed for acidity, heavy metals including arsenic), need of treatment should be assessed.

ENVIRONMENTAL RESOURCES MANAGEMENT THE PRIVATIZATION AGENCY OF SERBIA (RTB BOR EA)
Soil, Groundwater and River sediments

- geology and hydrogeology. To complete the environmental baseline, a number of new piezometers are proposed (about 10 at every site) to have more site-specific information. In particular, the aim is to further investigate on geological sections, stratigraphy, depth of shallow aquifer and flow direction. Specific studies will have to be developed for Cerovo, Veliki Krivelj, Majdanpek northern and southern pit and a more extensive study for Bor;
- groundwater general quality with particular regard to the impact from the open pits. To verify the influence of the open pit mine on groundwater quality, two piezometers are foreseen, one upstream and one downstream in flow direction; monitoring should be undertaken on a periodical basis (quarterly for the first two years then the frequency might be annual in case no impact is detected);
- river sediments characterisation at Bor. Contaminated sediments along river banks (Bor river and Krtvlejska river) will be analysed for pH, organic matter, mineral oil, hydrocarbons and heavy metals. The foreseen samples are approximately 200 (one every 250 m on the two banks, for an estimated linear extension of 25,000 m). Monitoring should be repeated once a year to ascertain the self-treatment of the river and to monitor eventual further impacts deriving from the RTB Bor Complex;
- river sediments characterisation at Majdanpek. Due to the lack of available data with regard to river sediments quality, a first screening is proposed to ascertain whether any impact is detected prior to proceeding with a comprehensive monitoring campaign. River sediments sampling from Mali Pek and Veliki Pek rivers) should be undertaken one point upstream of the outlet and two points downstream on the two banks (approximately 20 samples are foreseen at this stage). Sediment samples should be analyzed for: pH, organic matter, mineral oil, hydrocarbons and heavy metals.
- superficial soils quality. With regard to the Bor area, some samples of contaminated soils will be taken in an area (considered the most critical) of 5 km radius from the smelter, once a year. Eighty superficial soil samples will be collected and analyzed for pH, organic matter, mineral oil, hydrocarbons and heavy metals. With regard to Majdanpek, a surface soil sampling program is proposed in an area of 2 km from the tailing ponds. A total of 40 samples are foreseen to be analysed for pH, organic matter, mineral oil, hydrocarbons and heavy metals.
- soil quality at waste open dumps. Some samples of soils will be analysed for pH, organic matter, mineral oil, hydrocarbons and heavy metals. Grid sampling, based on a specified pattern with sample collection at regular intervals along that defined pattern is proposed. The foreseen samples are approximately 100 (on a sampling grid 20 x 20 m).

Legal and Institutional Framework

With regard to the Legal and Institutional review undertaken in the frame of the project, it is highlighted that the legal framework for environmental management has gone through an important phase of development over the past few years. Four key new environmental laws have been adopted including a new Environmental Protection Law which sets out the overarching structure for a modern environmental management system. The new SEA and EIA laws are starting to work as a powerful
tool for working towards more sustainable development and the IPPC law sets out a framework for a modern environmental permitting system.

A number of the necessary implementing regulations have been developed as well and more key regulations are expected to be adopted during 2006 including laws on air, waste, water and nature protection. They are all being developed according to EU standards and methodologies and aim to harmonise with EC Directives as much as possible.

The legal framework that is thus being built is of great significance as it provides for the establishment of an integral management system for natural resources, the introduction of the concept of sustainable development, prevention and control of pollution, informing the public and providing for participation in decision-making. These developments are addressing the previous problems related to the legal framework such as too many and conflicting laws, lack of regulation (e.g., for environmental permitting, environmental Fund, environmental management system), lack of public participation in decision-making, lack of clarity in terms of institutional responsibility etc.

In addition, autonomous province and local government are gaining more authority and a new and more important role in environmental management. There are still some problems connected to conflicts between the new environmental legislation and other laws such as the urban planning law which currently doesn't mention the need for EIA as part of the permitting process.

However, implementation and enforcement of this emerging modern legal framework is a great challenge and much remains to be done to make an impact on the ground.

Institutions at the local level cope with a lack of financial and human resources. They move towards creating greater financial independence such as through the set up of local environmental funds are a key step forward. Even though the funds expected to be collected are not nearly enough in comparison to the environmental infrastructure investment needed, they do provide a first step in the right direction and can serve as co-financing for attracting international funds. Much remains to be done in terms of training staff at the local level, set up stable coordination and cooperation mechanisms between different authorities and different levels of government, awareness raising on environment (outside as well as inside government), development of tools and guidance for the implementation of environmental laws, strengthening of the environmental inspectorate through training etc.

The following indications are given with regard to the legislative and institutional framework:

Legislation

- Further development of the legal framework in line with EC directives as planned;
- Identification and removal of conflicts between new environmental legislation and other laws;
- Adoption of the new regulation on the environmental fund within the Bor municipality, as soon as possible.

Institutional strengthening

EIA and Permitting
- Development of further tools and guidance documents to help better implementation of the EIA law.
- Training on implementation of the EIA law and IPPC permitting system at all levels.
- Strengthening of the local municipality environmental office (additional experts, additional trainings and necessary equipment, better coordination between the environmental secretariat and other offices in relevant sectoral policies and between environmental secretariat and local and republican inspections).
- Established Local Environmental Fund and training of the experts.

Inspection
- Creation of coordination mechanism between the republican inspectorate and the municipal environmental secretariats.
- Development of a strategic approach to inspection through the development of inspection plans at all levels.
- Further training for environmental inspectors.

Monitoring
- Further development of the monitoring system (clarify the role of certain elements in system and obligations of relevant subjects);
- Strengthening institutions relevant for monitoring system (especially the Agency for environmental protection);
- Solving the problem of further financing of the existing air monitoring system in Bor (guarantee will soon expire);
- Improvement of the self monitoring system in companies and coordination with local monitoring system.