

FD-AB1-137
80498



WEC STAFF

TRIP REPORT

BULGARIA AND ROMANIA

OCTOBER 11 - 24, 1992

NOVEMBER 1992

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I. ITINERARY

October 11, 1992

Sofia - Mr. Veselin Zlatev, Bulgarian Ministry of Industry and Mr. Kliment Dilianov, WEC Coordinator

October 12, 1992

Devnya - Soldi
- Agropolychim
- Polimery
- TEC

October 13, 1992

Sofia - Mr. Gerald Zarr, U.S. AID Representative and AID Staff

October 14, 1992

Veliko Turnovo - Deputy Mayor, Mr. Vaseelin Georgiev, and Municipality Officials

Svistov - Svilosa

October 15, 1992

Gabrovo - Mr. Ivan Nenov, Mayor, and Municipality Officials

October 16, 1992

Sofia - Mr. Gerald Zarr, USAID Representative and AID Staff
- University of Sofia

October 19, 1992

Bucharest - Mr. Richard Hough, USAID Representative and AID Staff

October 20, 1992

Pitesti - Mr. Tudor Pendiue, Mayor, and Ing. Mircea Popa, Deputy Mayor, and Municipality Officials
- Arpechm

October 21, 1992

Cimpuling - Grulen
- Aro

October 22, 1992

Cimpuling - Cimus

October 23, 1992

Bucharest - Mr. Richard Hough, USAID Representative and AID Staff

II. EXECUTIVE SUMMARY AND OBSERVATIONS

During a two week trip to Bulgaria and Romania, as a member of an AID Environmental Team, four potential candidates for two waste minimization projects (WMP) were identified in Bulgaria (Soldi, Agropolychim, Polimery, Svilosa) and four in Romania (Arpechim, Grulea, Aro, Cimus).

The opportunity to travel with Mr. Ronald J. Greenberg, Chief, Bureau for Europe, Agency for International Development, U.S. government representatives, other AID funded recipients, and to participate in the discussions with the AID representatives, was informative and helpful.

The travel schedule was tight and did not allow for factory inspections. Information was obtained at some factories with assurance that additional data will be provided. However, because of the restrictions placed on the gathering of environmental information by the Communists and the lack of state-of-the-art monitoring equipment and techniques, the enterprise management admits that the available information is not accurate.

The WEC coordinators will stay in communications with the enterprises to obtain more information about their operation.

In order to begin WMP in both countries in January, 1993 as requested by Messrs. Zarr and Hough, the selection of the enterprises will be based on a judgement of the enterprises' efforts to continue operations under the present difficulties of limited funds, higher energy cost and collapsed markets in the former U.S.S.R. and their strong commitment to WMP.

The companies selected will be made in December after receipt of additional information from them and the WEC Coordinators. Workplans for both countries are underway.

Thomas J. McGrath
Vice President
World Environment Center

III. MEETINGS

Sunday, October 11, 1992

Met with Mr. Kliment Dilianov, WEC Coordinator and Mr. Vaselin B. Zlatev, Senior Expert and Advisor to the Deputy Minister of Industry.

We discussed the logistics of my visit to the enterprises and the waste minimization program.

Also had a meeting with Mr. Dragostin Nikov who was formerly in the Ministry of Environment and had visited WEC last year. He is now the regional coordinator in Bulgaria for the Regional Environmental Center. He is operating as a one-person office, but hopes to have additional staff soon. He was interested in our programs and said he would keep informed about WEC programs through our newsletters. If there are opportunities for collaboration, he will contact WEC.

Monday, October 12

Flew with Mr. Zlatev to Varna where we were met by a representative from Soldi and and were driven to Devnya for a meeting with:

- Soldi - Soda Ash Producer
 - Mr. Nedialko Petkov,
Development Manager
 - Ms. Dimitova, Head of
Environmental Department
- Agropolychim - Fertilizer
Producer
 - Mr. Ivan Coparanov,
General Director
- Polimery - PVC, Chlorine,
Caustic Soda
 - Mr. Dimitar Angelov,
Deputy General Director
- TEC - Power Station
 - Ms. Milka Dilkova,
Environmental Specialist

A presentation about WEC's mission and programs and the proposed waste minimization project was made to the attendees at the Soldi facility. Each company representative responded enthusiastically and requested that their factory be the demonstration site.

Since only one site can be selected, they agreed that the Oversight Committee

concept would provide those companies not selected with the opportunity for more direct participation.

Time did not permit an inspection of any of the enterprises, but their representative said that they would provide WEC with information about their operations and their environmental concerns. Mr. Petkov, Soldi, advised that they are one of the largest producers of Soda Ash in the world with a production capacity of 1.5 million metric tons. He said world production was about 30 million metric tons. He further advised that the enterprise could benefit from the waste minimization project and provided information about the enterprise and its environmental problems. The information is in Bulgarian and will need to be translated.

Tuesday, October 13, 1992

Participated in a meeting with Mr. Gerald Zarr, USAID Representative and his staff as part of the AID Environmental Team. Discussion was about the overall objectives and logistics of the trip.

Regarding the WEC program, Mr. Zarr concurred that WMP projects should be done in the Varna/Devnya and Veliko Turnovo/Gaboro regions.

One of the plants on the WEC schedule is located in Svishtov. Although that synthetic fibre plant is 60 km. north of Veliko Turnovo, he agreed that it was a feasible candidate for a waste minimization project.

Mr. Zarr said that the following industrial sectors are targeted by the Bulgarian government to receive development funding: textiles, laminated wood, electronics, agroprocessors, plastics, fertilizers, cement and petrochemicals.

He does not see a need for HIID or Duke assistance at this time. EPA will not be involved in Bulgaria and, therefore, ELI's assistance will be needed.

Wednesday, October 14, 1992

Met as part of the AID Environmental Team, with the Deputy Mayor, Mr. Vselin Georgiev, and members of the Veliko Turnovo City Council. After being introduced by Ms. Lori Freer, each member of the team gave a brief presentation about their program. The Deputy Mayor and Council members pledged their full support.

The WEC country coordinator made arrangements for WEC development meetings during my trip. In the afternoon, I was transported to Svishtov by Ms. Petrana Rousseva, Head of the Department for International Relations,

Svilosa.

Svilosa is a synthetic fibre plant located on the Danube River approximately 60 km. north of Veliko Turnovo. Met with Mr. Radoslav M. Gabrovsky, Chairman of the Board, Mr. Boyan Iliev, General Director, Mr. Michail Koltchev, Deputy General Director, Production Department and Ms. Petrana Rousseva, Head of Department for International Cooperation.

Mr. Gabrovsky said that they have had no visitors from the West, but they had been in contact with Westinghouse to discuss their power plant operations. He expressed his appreciation to WEC for scheduling a visit.

The plant has a capacity to produce five million metric tonnes of rayon per year. Annual sales are approximately \$50,000,000. They consider their quality to be good as evidenced by exporting 60% of their production to the Western countries. Mr. Gabrovsky informed me that they are a new management team which the government put into the enterprise one month ago. They estimated that they are probably the largest polluters in the region. Their manufacturing equipment was last refurbished around 1970 and they don't really know when it was originally purchased. The previous management did not pay any attention to environmental concerns. Most of their waste is dumped untreated into the Danube. They do have a wastewater treatment plant but, at best, it may neutralize some of the discharge. Their data on pollution generation was collected by the previous management and until it has been verified, its accuracy may be questionable.

The new management is now taking action to develop more reliable pollution generation information. They strongly requested that WEC conduct a waste minimization demonstration project at their facility. Mr. Gabrovsky cancelled meetings so he could meet with WEC because of the importance of the proposed WMP project to Svilosa and the Svishtov region.

Time did not permit a tour of the facility. Mr. Gabrovsky expressed the opinion that Svilosa would be an excellent candidate for a waste minimization project because it is a large polluter of the Danube River, produced competitive products and will be an important contributor to the Bulgarian economy.

During our meeting, Mr. Iliev mentioned a problem they have with the government's definition of what qualifies as pollution prevention equipment. He said that if WEC supplied pollution monitoring equipment, they will have to pay taxes (15% of its value) for the equipment. He further said that the law is confusing and that they have strong disagreements with the government's interpretation which tries to claim all equipment as processing because it carries a higher rate. This information was provided to Mr. Ronald J. Greenberg, Chief,

Bureau for Europe, Agency for International Development, who said he would bring it to Mr. Zarr's attention.

Thursday, October 15, 1992

Met as part of the AID Environmental Team with Mayor Ivan Nenov and members of the Gabrovo City Council. After being introduced by Ms. Lori Freer, each member of the team gave a brief presentation about their program. The Mayor, Ivan Nenov, and Council members pledged their full support.

During the afternoon, several members of the team took a brief tour of a textile plant and a tannery. Both appear to be good candidates for a WEC environmental review.

As part of the AID Environmental Team, attended a reception hosted by the Friends of America which is a volunteer Bulgarian organization of private citizens that impressively is very pro American.

AID supplied information about Gabrovo and Veliko Turnovo and is included with this report.

Friday, October 16, 1992

Participated as a member of the AID Environmental Team which presented a report of the week's activities to Mr. Zarr and Mr. Bozhil Kostov. The WEC portion of that presentation is included in this report.

In the afternoon, at the request of Dr. Boyan B. Boyanovsky, Department of Ecology and Environmental Protection, Biological Faculty, Sofia University, who heard about the AID Environmental Team visit from the Ministry of Environment (MOE), I gave a lecture to Dr. Boyanovsky about WEC, its mission and programs. The students expressed concern about the commitment of the Bulgarian government and industry to cleaning-up environmental problems in view of the severe economic problems. I suggested that they obtain as much factual information as they could, become part of the solution to the environmental and economic problems and to think and act positive. I noted that my experience with the Bulgarian government and industry indicated that they have a strong interest in WEC programs and a strong desire to correct their environmental problems. I further commented that for waste minimization to be successful, the project must have the strong support of an enterprise's senior management and that strong support was given not only by the senior management but also local governments.

Saturday, October 14, 1992

Traveled to Romania with the AID Environmental Team.

Monday, October 19, 1992

Met as part of the AID Environmental Team with Mr. Richard Hough, USAID Representative. Our schedules for the week were discussed. Mr. Hough briefed us about his visit to Pitesti and Cimpulung and he gave his reasons for selecting this area for environmental programs. There are a number of companies in the region that are heavy polluters. The local governments are very supportive. The area is in the Arges River basin and a combination of programs could have an impact. The team then visited the Romanian Ministry of Environment and had a meeting with Mr. Vadineau, Secretary of State, Ministry of Environment. Mr. Vadineau will be leaving the Ministry. Among his comments, he expressed his opinion that there appears to be limited environmental interest exhibited so far in the new parliament. He encouraged NGOs to be professional in their relationship with the government. As he was leaving the meeting, he expressed his appreciation to WEC for the work it has done.

Tuesday, October 20, 1992

Met as part of the AID Environmental Team with the Mayor, Mr. Tudor Pendiue, Deputy Mayor, Ing. Mircea Popa, and members of the Pitesti City Council. The Mayor discussed their local environmental concerns and pledged the city's support to the team's efforts.

Met with Mr. Ion Cojocaru, Technical Manager and Mr. Gheorghe Florea, Head of Technical Analysis Department, Aprechim, S.A. Also in attendance was Mr. Radeanu from the Pitesti Environmental Protection Agency.

Arpechim is a petrochemical complex which began operations in 1969 using Romanian, Molex and UOP technology. Mr. Cojocaru advised that Romanian technology had been used to build oil refineries in Pakistan, India and Africa. The refinery design capacity is seven million metric tonnes of which 1.5% to 2.5% is specially designed to process crude oil with more than a 3.5% sulphur content.

The refinery has serious sludge problems from their wastewater treatment plant, petroleum sludge from the cleaning of tanks and air pollution problems, mainly SO₂.

The managers stated that their environmental program needs to be modernized. There are about 600 people involved in sampling and analyzing environmental

data. The process is slow because air pollution samples are taken by hand-held meters and each person brings data to the laboratory which is 20 years old, has no computers and antiquated equipment.

Mr. Cojocararu said that Davey McKee analyzed the plant and prepared a report for AID. We will contact Dr. Ichord and request a copy.

Mr. Cojocararu said that the factory is currently operating at about 40%. Their previous market was Iraq which was shut down by the war and the subsequent embargo. The loss of Yugoslavia as a market has exacerbated their problems. At present, only the acrylonitrile part of the petrochemical plant is operating. This represents about 35% of the plant capacity. The remainder of the operation is shut down.

They advised that they have had discussions with Coastal, a U.S. company, and are hoping for a joint venture. They were unable to give any detailed information about their prospects of success for a joint venture with Coastal.

Mr. Cojocararu requested that they be considered for the waste minimization project. He asked help for their wastewater plant. Of particular concern is that after the effluent is discharged from the lagoons, it has a concentration of phenol and flows through agricultural land on its way to the Danube contaminating that land with phenol.

Mr. Cojocararu said he would try to obtain written material and send it to the WEC Coordinator, Mr. Ionescu.

Time did not permit a tour of the plant.

Wednesday, October 21, 1992

Mr. Ronald J. Greenberg accompanied me on today's visits. We met with Mr. Nicolae Florea, Deputy Technical Manager and Mr. Sergiu Besleaga, Chief of Utilities Department of Grulen, a synthetic fibre manufacturer.

Mr. Florea said that the company is profitable and efficiently operated. There are three parts to the operation. Processing, maintenance and utilities. They have an Environmental Control Department which is responsible for general protection, safety of the processes, fire and environment. The company has one person in the lab and one biologist responsible for wastewater and air pollution analysis.

They license technology from Tori Chemical for the production of polyester fibre, both commercial and industrial grades. They produce 32,000 metric

tonnes of fibres, 50.5 metric tonnes of polyester chip and 14,000 metric tonnes of methanol as a by-product. They have two other locations which produce fibre and yarn, one located near the country's northeast border and the other one south of Cimpulung on the Danube River.

Mr. Florea said that their markets were in the former U.S.S.R. Product was shipped to Moscow which served as their distributor.

After the collapse of the U.S.S.R, Grulen has had to send representatives to Moscow to try and find out who their customers were and how much they purchased. They have representatives there now to establish contact with old and new customers.

Their main pollution problems are wastewater and air. They use 150 tonnes of oil per day. SO₂ is a major problem caused by the use of oil from Pitesti which has a 3.5% sulfur content. They said they meet emissions regulations which is calculated from material balances by the local EPA.

Liquid waste receives biological and chemical treatment and then discharged into the city sewer system at the rate of 2,300 cubic meter/day.

Solid waste goes to a landfill but should be incinerated to destroy any toxic material.

Mr. Florea expressed a strong interest in the waste minimization project and requested to be considered as the demonstration factory.

We next visited the Aro car factory. Please refer to the enclosed reply received in response to the WEC questionnaires prior to our visit. It provides information about the company and its environmental concerns.

Aro produces 25,000, 4 x 4 wheel drive cars in 30 different models. The cars are made to use leaded gasoline and because of the air pollution they generate, the cars are not allowed to be exported to the E.C. countries. However, they are exported to Asia, Africa and South America.

In order to export to the E.C., Aro now imports Ford engines for its largest cars, Peugeot 2.5 liter diesel engines and Renault 1.9 liter diesel engines for cars built for export. About 30% of their production contains imported engines.

Mr. Voisnesco, Technical Manager, advised that there are 10,000 employees working three shifts. Their problems are with sludge generated from the galvanization process. Other problems are the generation of nickel, reactive cadmiums, cyanides, and chromium which result from their protective plating

operation.

They hope to build a new galvanic plating shop and substitute cadmium plating with alkaline zinc.

Wastewater run off flows into municipal sewage system. They comply with local standards but he believes that the local standards are too mild. He said that years ago trout lived in the river, but now there are no fish in the river.

He would like to have a central wastewater treatment plant built which he estimates would cost one million dollars. He said they can't borrow the money from Romanian banks because of the 80% interest rate.

He would like to obtain external funding with a reasonable rate of interest. He discussed it with EBRD, but believes Aro will not get the funding because other companies in Western Europe don't want Aro to compete with them.

He is interested in the waste minimization project and he requested a copy of our Memorandum of Understanding which will be mailed to them.

At present, they are operating at 75% of capacity and he expects that they will continue in operation because they manufacture a quality car.

Thursday, October 22, 1992

At the recommendation of Mr. Hough, Messrs. Jack L. Schramm, a Senior Vice President and Michael Ellis, Manager of Haigler Bailly, Inc. and I visited Cimus, a cement factory. We met with Mr. Gheorghe Depenel, General Manager. Enclosed is a copy of the information supplied by Cimus in response to the WEC questionnaires. In addition, the following information was obtained during the meeting about their cement production.

- Process - Dry
- Raw meal is ground and has a 12-15% moisture content
- Raw meal - ball - Six raw meals
- Horsepower - 1,600 kilowatts
- Output - 65-70 metric tonnes per hour for each mill which is close to design capacity
- Have a closed circuited system

- Use static air separator. Have a grit classifier before the static air separator and after them - four cyclones for each mill
- Do not use roller mill ahead of the ball mill
- Input size of raw mill - .30 millimeter - sometimes larger
- Need to dry raw meal
- Grind and dry at same time
- Air circuit is ventilated with hot air from clinker oven
- Kilns - Horizontal rotatory - 800 metric tonnes of clinker per day four meters by 54 meters long. Each kiln has a WEDAG type heater
- Require 1,050 kilo calories per one kilogram of clinker compared to Japanese who require 700 - 720 kilo calories per one kilogram of clinker
- Fuel-natural gas and fuel oil
- Have Lurgi electric filters
- Dust collected in baghouse and returned - efficiency rate 95% at kiln baghouse
- They take material from a quarry and crush it to make four types:
0-30 millimeters which goes to cement production
30-50 millimeters crushed again then goes to cement production
60-90 millimeters which goes to lime production
Over 100 millimeters delivered to other industries
- They make two kinds of cement to standards BS 1278 and PA 35
- Romanian standards require testing after two days and 28 days of curing
- Last year they wanted to refurbish the factory to allow them to burn petroleum coke. Three lines would be refurbished for this purpose but couldn't raise funding. They have contacted a Canadian company for funding. They want to eliminate three production lines and replace them with one line which would have same amount of output but be more efficient.
- Last summer they operated at 70% capacity. Now at 50%. Will

probably be at 30% during the winter. Export about 30% of their production to Spain, Africa and Sri Lanka.

- They are switching from natural gas (over 4% sulphur) to low sulphur coal obtained from Poland.

Mr. Ellis advised WEC that Resource Management Associates of Madison performed an audit of Cimus for the AID energy program and he gave WEC a copy of that 40 page report which is not included with this report.

Requested that they be the waste minimization demonstration factory and offered their full cooperation, if selected.

Friday, October 23, 1992

Participated as a member of the AID Environmental Team which presented a report of the week's activities to Mr. Richard Hough and Ms. Gianina Moncea. The WEC portion of that presentation is included in this report.

IV. DOCUMENTS

PROBLEMS

GABROVO

Gabrovo is a heavily industrialized city. It has a leather, textile, food processing, electronics, machine tool, etc industries. All of them are said to have local water pre-treatment installations. Part of the industrial water goes to the city collector for further treatment by the city sewage plant which requires further investment. The part of the plant in operation treats 480 liters/second while its planned capacity is 917 liters per second city output being 1100 l/s. The city authorities define their priorities in the following way: to finish construction of all components of the sewage treatment plant, to connect the industries and residential areas on the north bank with the collector system (now sewage and industrial water is directly mouthed into the river). The plant was planned as a partnership between the local government and 22 industries. Due to lack of funds they could not finish constructions but they are still working on it. The quality of river is said to have radically improved since the plant has started working and now the city is proud to even have fish.

The city has some controversial problems with drinking water. Health Office experts say that drinking water quality is bad due to excessive chlorination to prevent epidemics especially in summer. Regional Inspectorate and local government do not agree with this view. Water Supply Company Director is looking for funding to replace outdated and inefficient aerators to improve water quality and reduce electricity costs. The University is being said to have developed a comparatively cheap ultra-violet ray installation for drinking water treatment that nobody is interested in. Leaks are about 30%.

Another issue is soil pollution. Virtually they do not have any information about the situation because the cooperative farms do not exist any more and the information system has disintegrated. The Corporation for agricultural services which is supposed to give the information still exists but is inactive because the private farmers do not use their services (it used to consult farms on contents of fertilizers and nitrates and advise them on what fertilizer they should use and how much they should apply).

Air pollution is also a problem on which there is some disagreement between the different agencies concerned. The HO, REI and Local Government officials seem to share the same opinion and still disagree with each other. They all believe that a way to address the problem is by building highways outside the city so that transit traffic does not

cross it. On the other hand they are rather vague on emissions and immissions from local industries.

Occupational safety seems to be a serious problem.

The local government is planning to develop the city as an industrial and tourist center by helping the local industries and developing the traditional crafts and some high mountain resorts that are on its territory.

LOCAL GOVERNMENT

The Gabrovo Council consist of 64. It is UDF dominated and only its Chair is full-time. Her background is sociology.

The local government have increased their staff in charge of environment and now has two environmental experts. One is a chemical engineer and the other is a forestry engineer. They are under the City Planning Division chief. They have been asked by the Environmental Committee at the Council to prepare an overview of environmental problems which they have done on the basis of the information they have on what has remained unfinished from previous years (sewage treatment plant, etc.) They regularly receive information from the REI with whom they work closely, and only sporadically from HO. There is some tension between them and the HO because the latter have come up with statements about health risk with which the local government strongly disagrees. It is basically the two experts who prepare decision for the Mayor and the Council Committee.

The Council Committee on environment consist of five. Its Chair acknowledges that they do not have the time to work more consistently on environmental policy and rely heavily on staff recommendations. For him one of the most serious problems is enforcement especially of the laws and standard for the import of hazardous materials. According to him the city is most seriously affected by the lack of enforcement of these particular regulations because of the type of industries - leather, textile, etc. He believes that occupational problems will become more and more serious as companies continue to import and use in their processes highly contaminant materials.

All local government members were very supportive of the ETP. The Deputy Mayor supervising environment, the Chair of the Council and the Chair of the Committee on environment have promised their full cooperation. They are willing to make a list of people on whom they do rely and have committed to rely in the future to attend the training without cutting their time.

The local government owns the local press and has a say on what should be published.

NGOs

There are no big NGO in the city. There are a number of people - mass media, HO and some others, who have close contacts with the National Movement of Ecoglanost but they are not organized and only rarely meet. they do not have a program or an action plan and are rather confused as to how to proceed. The HO Ecoglasnost person has however managed to prepare a board where she exhibits data about air pollution. She has regularly writes in the press. On a number of occasions she is said to not have been allowed to do so.

VELIKO TURNOVO

Veliko Turnovo has fewer industries than Gabrovo. There are electronics, TV, and some big food-processing plants - mainly meat and milk. The latter cause serious water pollution. The part of the sewage treatment plant that is currently in operation has shown considerable defects and it is believed that the plant could not be completed in the way it was planned. It is also inadequate to meet city demands. In summer when the flow is low, the river stinks. It enters the city comparatively clean and leaves it dead.

Drinking water is no longer considered a problem, though leaks are reported to be up to 50%. The city takes its water from a dam in the mountain and it no longer has water rationing. The quality is reported as adequate.

Air pollution from traffic is heavy but there are no industries that contribute considerably to it. Still, since the area for construction of roads is limited, it is concentrated in certain parts of the city.

Turnovo is an agricultural center and soil pollution with pesticides is believed to be high. The soil map of the district shows considerable erosion and degradation of farm land.

Two priorities have been outlined by Council, Local Government and NGO representatives. The first is treatment of sewage and food processing industries water. The second is the incineration or deposition of animal corpses from the meat industry and the smaller farms. The corpses are said to be scattered all over the area, usually in the vicinity of villages, creating in this way a danger for epidemics.

LOCAL GOVERNMENT

The Council consists of 65, with 30 BCP, 4 UDF, and Center parties. Its Chair is BCP. The Mayor is UDF.

The local government has one environmental expert who is directly answerable to the Mayor. His responsibilities are

to work closely with the Council Permanent Committee on Environment, make sure that their decisions are fulfilled and implement the policy they outline. The Committee of seven have decided that they are not in a position to develop an overall strategy since they are unlikely to implement it due to the shortage of funds. They have decided instead to try and identify the problems that are most visible and are within their powers to address. They have made a number of decisions to this effect. Part of them were fulfilled and have lead to the rapid improvement of the landfill management, increase of trash collection fees to cover costs more adequately, reconsideration of the sewage water treatment facility plans, etc. Some decisions which require action and information from REI and HO however have not been fulfilled. They have defended and received a 150000 leva budget for the sewage treatment plant but the money has not been used so far because of conflicts with the engineering company.

The Permanent Council Committee is very active. Its Chair goes out on inspections with the environmental expert, calls regular meetings and the Committee works with all departments of the administration. The Committee Chair is very supportive of the ETP.

The Deputy Mayor believes that environment is still treated as an issue which could help parties or individuals obtain popularity. As he says "More is being said than done". For him the reasons for the impossibility to make decisions that go beyond defining an engineering solution are: a/ lack of experts who could assess the problems and come up with solutions from a broader perspective; b/lack of information which is not purely technical and which will help the government make decisions.

Both the Council Chair and the Deputy Mayor emphasized the need to train people who could manage the environment. They were also very supportive of the project and promised to provide help if needed.

The local government are planning to develop the city as an agricultural, tourist and banking center. There are already 11 banks part of which are going private.

NGOs

There is a National Movement of Ecoglasnosts chapter, Ecoglasnost-Center group and a Green Party in the city. The NM EG chapter has been only recently revitalized. It is starting an office, a center for consultations to farmers, a group is being proposed to work with the Cooperative Farms Liquidation Committees to protect farmers from buying sick cattle, and has already submitted a number of requests to the local government, the Veterinary Medical Institute and the REI. They are interested in starting a public outreach

program but said that they do not know how. Members of the chapter are some private producers of water treatment equipment.

BUSINESS

There are some private environmental businesses in the area. In Gabrovo a private business is doing the engineering project of a water treatment installation for a big government industry, another one is constructing the city collector. A private business is negotiating with the leather factory to process their wastes but has some difficulties in persuading the factory management to let it have the wastes. A company has applied to buy trash collection rights.

The Peace Corps small business volunteer and the multi-link one have their office in the City Hall. The small business program finds the local government and the Chamber of Commerce very responsive. The multi-link volunteer is interested in helping an environmental program.

In Turnovo three private businesses and the municipal utility share trash collection. There are a number of producers of small treatment installations who mainly contract with an "Academy" partnership of a number of local industries, the local government and the Bulgarian Academy of Sciences. There is also a First Private Academy formed by sewage water experts as a consulting and design business.

There is much potential in both cities for promotion of environmental business because of the experts they have in the Universities and the Bulgarian Academy of Sciences institutes on their area. The Gabrovo local government is seeking experts for impact assessment, expert groups for permit issuing, etc.

UNIVERSITIES

The Gabrovo Technical University has a number of engineering departments, one of them being "Environmental Engineering" which has admitted its first 25 students this year. They will study general engineering subjects during the first three years, plus clean-up technologies, monitoring technologies - design and use; clean-up installations, resource management. They will also have approximately 250 hours of lectures and seminars in company management; economics and production management. Students will have thirty hours of "Environmental engineering and protection of the population". The University has a new industrial management department which teaches economics, marketing, general management, financial, personnel, information and company management, law, statistics, accounting, etc. Students are now in their first year. Some of the tuition is

paid. They have just started a 2-and-a-half year business training which is also paid. The University has contacts with the University of Delaware Business Project and a German Foundation which helps them develop their curricula.

The Turnovo University gives degrees in languages, law, economics, geography, history, philosophy. Students are basically trained for high school teachers. Professors commute from the Sofia University and the Bulgarian Academy of Sciences. There are some assistant professors from Turnovo. The Law Department is planning to have environmental law at some point in the future. The Economics Department (business management) has started paid tuition this year. The Geography Department has a new degree in "Geography and Geo-ecology" which includes numerous specialized subjects plus demographic studies, natural resources management, economics and geography, society's impact on environment, geoinformatics etc. Tuition is paid and first students were admitted this year.

In general both Universities are introducing environmental subjects. Most of them are very specialized and do not give a general overview of environmental management. The curricula are not fully developed yet, i.e. the Engineering Ecology in Gabrovo, the Law and Geography Departments in Turnovo are still considering the type and exact format of the subjects to be taught. On the other hand they are very open to suggestions. If the right facilitators are selected they could be expected to integrate the modules in the curricula.

MONITORING AND INFORMATION COLLECTION AGENCIES.

There are an unidentified number of institutions the responsibilities of which are to collect data and monitor the environment in the region.

The REI, the regional representative of the MoE, has its main office in Veliko Turnovo and two resident employees in Gabrovo. One of them, Koluy Vurbanov, is the Deputy Director of the whole REI. The REI covers an area downstream Yantra to Byala. Only a small section of the downstream Yantra basin come under the jurisdiction of the Rousse REI.

Three HOs, as Ministry of Health branches, cover the area of the Turnovo REI. They have their offices in Gabrovo, Turnovo and Gorna Oryahovitza, the latter being called "The Railway HO". There is a Regional Health Information Center in V. Turnovo, too but it is unclear what information they gather and whether they are related to the HO or are directly under a Sofia institution - either the MoH or its National Health Center. (They were closed on the day of the visit.)

Other institutions that collect data are the Veterinary Medical Institute, a branch of a Sofia-based, national network. Its regional office is located in Turnovo and has offices in other cities and towns in the whole area. They, like the HO do tests on foods but are mainly concerned with animal foods - meat, milk, etc. They monitor radioactivity, heavy metals, nitrates and other contaminants in animal food as well as some diseases like TB that could be transferred to people. Some of their staff have followed trends in the last decades and are doing research on immunity and causes for it decline.

Another institution is the Corporation for Agrichemical Services, which is also a national network with a central office in Sofia. In the past cooperative farm agronomists brought the Corporation soil samples, had them tested and were told how much fertilizers to spread. The data were compiled and could be used by farm management and local governments. The Corporation still exists but their services are seldom sought so there isn't much recent data there.

The ViK (Water Supply and Treatment Co) is subordinated to the Ministry of Regional Development, Housing Policy, and Construction. They, like the HO, monitor drinking water quality as well as sewage water. They have labs at the Sewage Water Plants and do tests daily. In turn their tests are monitored by the REI and HO.

There is a regional branch of the Institute for Hydrology and Meteorology, a Bulgarian Academy of Sciences institution, who monitor air and water and have a rather complete record over the years.

The Quality Center is a branch of the Committee for Standardization and Quality. They test consumer goods and issue certificates that certain products meet quality requirements and standards for contents like nitrates, etc. The forestry Committee local branch collect information about logging, forests, wildlife and everything related to it.

It is rather confusing who does what and gives to whom. It seems that the information flow depends to a great extent on personal relationships between individuals from various institutions. Also requirements seem unclear so data that are sufficient and representative for some, are insufficient and unreliable for others and unclear to some others. They are never prepared or even meant to be analyzed and prepared for decision-makers and the public. It is also fragmented and in a form that is impossible to compare.

CONCLUSION

Both cities are very eager to be the ETP center in the area. There are some rivalries between them because both are big cities and compete in who will do more. Both cities recognize that they have experts on technical issues but no specialists in environmental management, economic analysis, etc. Though the regional offices of the national agencies work with the local government, with few exceptions, they do not cooperate with the NGOs and have no idea how to respond to public demand. They also feel somewhat superior and are not prepared to provide information in a form that could be used by decision-makers or the public. There is much institutional rivalry and overlapping of responsibilities. At the same time some areas are not covered at all. The local governments need competent experts who could summarize the technical information from different sources and provide alternative solutions. They are afraid that otherwise some serious mistakes could be made since various companies are making offers now to build incinerators, etc. The Ecoglasnost Chapters need training and help in capacity building and public outreach. Relations between the different groups are in most cases sporadic and depend on personal good will. Some of the problems and most of the institutions are common for the two cities.

Since they are so close to each other, the project could easily work in both of them. Facilitators for the trainings could be invited from both Universities and trainings could be sited alternatively in Gabrovo and Turnovo. But participants should always be from both cities.

Presentation note

Present note was prepared according to the WEC questionnaire and was translated from the original Romanian version by Liviu Ionescu.

A. Generals

ARO S.A. is more than 100 years old, having an important place within the Romanian industry. Situated in the North-Western part of Cimpulung-Muscel town, ARO S.A. takes about 490,000 square meters. The factory has own water source, consisting of seven medium-depth wells. For generation of energy the factory burns oil and methane gas.

B. Fabrication

The main products of the factory are the four wheel drive cars, with Otto, or Diesel engine.

The factory is equipped with classical machine tools for machining, forging, stamping, and with heat treatment, painting and assembly lines. Products are preserved and stored.

Main hazardous materials handled in the factory are classical painting and galvanic protection materials: base-paints, enamels, cyanides, materials containing Cadmium, Zinc, Nickel, Copper etc. Possible sources of pollution are the oil by-products: oil, gasoline, Diesel-fuel, emulsion of oil used as cooling agent during machining.

The factory is equipped with 20-25 years old equipments. There are also newer facilities, mostly Romanian made, but also imported from China and Germany.

C. Ecological practices and problems

The Environment Protection Department consists of two laboratories:
- one dealing with potable water (input water);
- one dealing with waste waters (exhaust waters).

The Environment Protection Department is included in the Work Safety Department.

Main problems:

- the factory lacks a central treating station of all the exhaust waters;
- rain water is drained straight into Tirgului River, washing away various suspensions and oil by-products.

Every department must immediately report any pollution incident and take appropriate actions to stop impurification.

Treated waters are disposed of in batches. Disposal is made under the strict supervision of the Work Safety Department.

Press filters and exhaust channels are sealed by the Work Safety Department. Seals are only broken by authorised persons that supervise disposal of neutralised waters.

Daily, the rain and sewage network are checked, in order to detect any impurification. The sources of pollution are inspected on a weekly base.

Main air pollutants

- Carbon monoxide;
- Carbon dioxide;
- NO_x.

Main water pollutants

- Ammonia;
- Aromatic hydrocarbons;
- Dust;
- Cyanides;
- Heavy metals;
- Chlorines;
- Chromium;
- Oil by-products;
- Complex salts of metals and non-metals.

In most cases, new workshops were equipped with environment protection facilities (treating stations, oil separators, cyclons).

Places with high pollution hazard

Galvanic plating shop-commissioned in 1975.;
Galvanic plating shop No 2-commissioned in 1992;
Painting shop No 1-commissioned in 1972.
All the above shops are equipped with Romanian made products.

D. Applied standards

Usual Romanian standards referring to air and water pollution are applied

E. Main actions to improve environment pollution prevention

Study of possibility to build a central water treating plant-1992-1993
Updating of the environment protection laboratory-1993.
Study concerning disposal of industrial residues (galvanic sludges, base-paint sludges, oil residues)-1993-1995.

Translation from original in Romanian

Ecological Presentaton Note CIMUS-Cement Factory, Cimpulung-Romania

Generals

Work on the site of CIMUS S.A. started in 1959.

Commissioning of the factory started in 1972 and ended in 1974.

The factory was built in two stages:

- first stage : a cement factory, with six production lines and a lime factory, with two production lines and a lime hidration line;
- second stage : a granulite factory, the light masonry blocks section and equipments for sorting, storing and shipping of the limestone for the chemical industry.

In 1985, in order to partially avoid burning of fuel, an equipment for preparation and burning of the coal was built.

Presently, the factory employs 18000 people.

The factory lies on approximately 120,000 sq. m., on the valley of Argesel River and has direct acces both to Cimpulung-Brasov and Cimpulung-Tirgoviste roads.

The factory burns in the production process methane gas and fuel oil. Installed power is 34 MW.

Water is taken from the water supplying system of Cimpulung town.

Raw materials used are: limestone, clay, pirites, gypsum.

The "Mateias" quarry, situated 1800 m. away provides the limestone for the cement factory, the lime section as well as for deliveries to the chemical industry. In the quarry, primary and secondary milling are performed. The milled material is transported by conveyors (belt) and stored. From the storage place, limestone is extracted by drilling machines and conveyed by belt-conveyors to the bunkers of the grinding mills.

The clay quarry is situated about 1 km. away. Clay is extracted and loaded onto trucks by excavators. The clay is then transported to the milling-drying stations. The milling-drying station consists of three lines each having one metallic-plate conveyor, one hammer mill, one tubular dryer and belt conveyors heading to the flour-mill workshop. The gypsum quarry is equipped with drilling-machine, escavators, trucks, impact-mill and a ropeway that transports the materials to the bunkers.

Gypsum is used to set curing-time of the cement.

Informations regarding products and fabrication

The main products of CIMUS S.A. are: cement, lime lumps, wet lime and light masonry blocks.

Cement is obtained by grinding the clinker with various ingredients, depending on the type of the finished product. Various quantities of clinker, slag and gypsum are mixed, in order to obtain: Pa 35, P 40, M 30, BS 12/78.

The raw materials -lime and clay rocks-, are ground to obtain cement than homogeneised with corrective ingredients -pirites ash-, thus producing raw cement powder. Grinding is performed in one room tubular ball mills. The ground material is carried away by the flow of recirculated gases into the static separator. Gases, free of coarse particles are aspirated into the bunkers of the Fuller pumps and into the homogeneiser and storing sylos.

The homogeneised powder is taken into the Wedag-type heat-exchanger, in counterflow with the gases coming from the oven, is heated and then to the rotating oven, where it is clinkerised. From here, the clinker falls into the Fuller-type grate cooler and a chain and belt conveyor transports it to the storage sylos.

The cement-mill workshop is equipped with 5 double-room, tubular, spheric-balls mills. The mills are continuously fed with clinker, slag and gypsum, in appropriate proportions, to suit the type of cement to be obtained. The ground material is evacuated from the mill, then it is lifted by an elevator up to the separator. A fan produces an air-stream that carries away the fine particles to a system of five cyclons, where they are separated from the air. The cement falls in the pits and the air, aspirated by a fan. Dust is trapped in an electro-filter. Cement is transported to the 12 storing sylos by two belt-conveyors and pneumatic gutters.

Imported equipment: Wedag mills, Fuller pumps, Wedag heat-exchangers, Fuller-Constantin cooler. The lime ovens are produced by Maerz and the lime wetting equipment is Cim. Progetti.

Environment protection problems and practices

Environment protection activity is coordinated by the Work Safety and Environment Protection Department. The WSEPD is subordinated to the General Manager of the factory and fulfills surveying tasks in the fields of work safety and environment protection.

Main concerns are air and water pollution. Presently, a survey is in course on the production process to spot work safety and environment pollution problems.

The company management has set some objects to protect the environment (see Appendix 1).

Types and quantities of pollutants

Air pollutants:

-sedimentable, non-toxic powders	8,138 metric tons/year
-carbon monoxide	1,080 metric tons/year
-carbon dioxide	639,184 metric tons/year

Water pollutants

-suspensions	11.3 m. t./year
-oil by-products	no available data
-no hazardous or polluting wastes	

Type and age of existing pollution prevention equipment

Water

-neutralisers	20 years
-oil separators	20 years
-Inhoff decantors	20 years

Air

-electrostatic filters	20 years
-bag filters	14 years
-frame filters	10 years
-multicyclons	20 years
-cyclon batteries	20 years
- "Pulse-Jet" vibration filters	less than one year.

"Pulse-Jet" filters are imported from U.K.

Romanian standards are applied both in production and environment protection activities.

Environmental protection actions

p 3

Actions	Schedule	
	Start	Commiss.
Additional oil by-products separator	1992	1993
Mounting of dam-flowmeters on outlets to emissary	1992	1992
New equipment for water treatment stations	1992	1993
Up-dating of the electrostatic filters by increasing the pitch of the electrodes from 250 to 300 mm, and increasing the supply voltage, in order to get a higher trapping efficiency.	1992	1994
Mounting of "Pulse-Jet" filters to replace the inverse blowing type filters presently used to trap dust at the flour sylos.	1993	1994
Mounting of "Pulse-Jet" vibration filters to trap dust from separators and elevators from the cement mills	1994	1995
Mounting of "Pulse-Jet" filters to trap dust at the cement sylos	1995	1995
Mounting of multicyclons to trap the dust at the clay driers	1993	1994
Up-dating of the multicyclons from the clinker coolers, in order to raise their efficiency	1992	1993

Resumé of the original in Romanian.

Translated and typed by Liviu Ionescu.

INDUSTRIAL POLLUTION PREVENTION AND REDUCTION

1. Objectives

Technical assistance, training, and equipment will be provided by AID through the World Environment Center (WEC) to introduce more efficiency technology and monitoring equipment, improve management in pollution prevention efforts, demonstrate private sector approaches to industrial environmental management, and address hazardous waste management issues.

2. Overview of WEC Representative Visit, October 12-16

The purpose of the WEC visit was to identify industries in Bulgaria to participate in a one year waste minimization program. and present information to the Government of Bulgaria, the municipalities of Veliko-Turnovo and Gabrovo, and selected industries about the waste minimization program, and pro bono assistance offered by the World Environment Center. This program will provide technical cooperation and technology transfer from U.S. industry, academia, and government sources. All Bulgarian representatives expressed strong interest in cooperation with the U.S. in the programs available from the World Environment Center, and in participating in the WEC programs that will result in the improvement of environmental management, provide economic benefits, and build in-country capability of enterprises and consulting firms to undertake waste minimization programs.

3. Plants Visited

The following organizations and plants were visited by the World Environment Center:

- Soldi-Devnya
- Agropolychem-Devnya
- Polimery-Devnya
- Svilosa-Svistov
- Textile Plant-Gabrovo
- Tannery-Gabrovo

4. Coordination

WEC will jointly coordinate its activities with the Ministries of Industry and Environment. Other AID contractors/cooperators will receive progress reports from WEC to foster closer project collaboration.

5. Summary Findings

The industries that were visited enthusiastically offered their support and several have already submitted data in the hope that their enterprises will be selected. Current funding allows for three waste minimization projects and two environmental assessments. All enterprises visited strongly requested that they be participants in the waste minimization program.

To obtain maximum benefits of the waste minimization projects, the directors of all the enterprises agreed with the WEC suggestion that directors of other enterprises in that region and local consulting firms be members of an oversight committee for the demonstration so that there will be greater awareness of waste minimization approaches.

6. Specific Areas of Cooperation

WEC will provide assistance in two areas:

- demonstration of waste reduction and pollution prevention through technical assistance from U.S. consultants and the use of U.S. environmental equipment.
- provide environment and industrial representatives with information about environmental technologies and processes available from the U.S.

7. Demonstration of waste reduction and pollution prevention

It has been agreed that the WEC program will start the first waste minimization project at Soldi-Devnya within three months. Approximately three months later, the second demonstration will be initiated at the Svilosa-Svistov. A third site will be chosen in southern Bulgaria based on a list of priority companies provided by the Ministry of Industry.

8. The WEC cooperation in industrial pollution prevention can be undertaken through a program that will include:

introducing monitoring and process equipment and technical assistance

providing in-depth, recurrent technical assistance and training in no cost/low cost pollution prevention and waste minimization activities

holding a regional workshop on waste minimization and presentation of case studies from the selected industries

9. In the initial phase, after a technical evaluation of equipment needs and benefits, WEC will purchase, provide and assist the plants to install some monitoring/measuring equipment that will provide economic and environmental benefits. 2 U.S. specialists will visit select plants and specify the needed monitoring/measuring equipment. It is estimated that the selected specialists will spend 2 to 3 days per plant and provide WEC, the plants, and the GOB with recommendations.

10. The selected industries were chosen because they will be privatized and are important to the future economic development of Bulgaria. Initial criteria for the selection and approval of the plants are that the plants are likely to be economically viable after privatization and restructuring, they have major pollution problems, and the plant directors are willing to participate in a year long program of monitoring, technical cooperation, and information dissemination.

11. The selected industries agreed to sign a one year memorandum of understanding with the WEC.

12. All assessments will be jointly undertaken by WEC specialists, 1 to 2 Bulgarian environment plant engineers, and 1 to 2 technical specialists from the Bulgarian engineering or technical sector. The purpose of this joint team effort is to strengthen the Bulgarian expertise to undertake these assessments and support the development of a private sector environmental services capabilities. The assessments are anticipated to take approximately two weeks.

13. Two committees will be established at each enterprise and operate for the duration of the waste minimization demonstration. An oversight committee comprised of WEC specialists, senior management of the selected industry, and senior management of other enterprises in the selected region. This committee will guide the overall demonstration. A waste minimization committee comprised of WEC specialists, local consulting firms, enterprise managers, and workers from the plants relevant departments will implement the demonstration.

14. Publicity

WEC, in conjunction with the office of the USAID representative, the enterprises, and the Bulgarian government will provide publicity during the demonstration. The objective of the publicity will be to inform the general public and non-government organizations about the purpose and results of the waste minimization program. It is anticipated that the publicity will consist of press releases, a brochure describing the program, interviews with enterprise managers, AID office representatives, and Bulgarian authorities.

Attachment 6

Publicity will start when the U.S. equipment arrives, signalling the start of the demonstration. Publicity for the environmental assessments could include press releases and seminars.

INDUSTRIAL POLLUTION PREVENTION AND REDUCTION

1. Objectives

Technical assistance, training, and equipment will be provided by USAID, through the World Environment Center (WEC), to introduce more efficiency technology and monitoring equipment, improve management in pollution prevention efforts, demonstrate private sector approaches to industrial environmental management, and address hazardous waste management issues.

2. Overview of WEC Representative Visit, October 19-23

The purpose of the WEC visit was to identify industries in Romania to participate in a one year waste minimization program, to present information to the Government of Romania, the municipalities of Pitesti and Cimpulung, and selected industries about the waste minimization program, as well as the *pro bono* assistance offered by the World Environment Center. This program will provide technical cooperation and technology transfer from U.S. industry, academia, and government sources. All Romanian representatives expressed strong interest in cooperation with the U.S. in the programs available from the World Environment Center, and in participating in the WEC programs that will result in the improvement of environmental management, provide economic benefits, and build in-country capability of enterprises and consulting firms to undertake waste minimization programs.

3. Plants Visited

The following organizations and plants were visited by the World Environment Center:

- Abpechim-Pitesti
- Grulen-Cimpulung
- Aro-Cimpulung
- Cimus-Cimpulung

4. Coordination

WEC will jointly coordinate its activities with the Ministries of Industry and Environment. The WEC program will work closely with RCG/Hagler, Bailey, Inc., to identify an enterprise for a possible joint program. Other USAID contractors/cooperators will receive progress reports from WEC to foster closer project collaboration.

5. Summary Findings

The industries that were visited enthusiastically offered their support and several have already submitted data in the hope that their enterprises will be selected. Current funding allows for two (2) waste minimization projects and two environmental assessments. All enterprises visited strongly requested that they be participants in the waste minimization program.

To obtain maximum benefits of the waste minimization projects, the directors of the enterprises agreed with the WEC suggestion that directors of other enterprises in that region and local consulting firms be members of an oversight committee for the demonstration so that there will be greater awareness of waste minimization approaches.

With the exception of Grulen operating at 75 percent capacity, other plants are presently operating at or below 50 percent capacity. Demand will decrease during the winter months and due to carefully rationed fuel, capacity utilization will further decline.

It is recommended that one waste minimization demonstration project and one environmental assessment be conducted in the Arges River Basin. This one demonstration project should provide sufficient impact in that region. A second demonstration project and environmental assessment should be conducted in another section of the country.

6. Specific Areas of Cooperation

WEC will provide assistance in two areas:

- (1) demonstration of waste reduction and pollution prevention through technical assistance from U.S. consultants and the use of U.S. environmental equipment.
- (2) provide environment and industrial representatives with information about environmental technologies and processes available from the U.S.

7. Demonstration of waste reduction and pollution prevention

The first demonstration project will start in January at either Grulen or Cimus, depending on additional information. The plant that is not chosen as the demonstration site will receive the environmental assessment. The second demonstration and assessment should be conducted in a different region of the country, approximately two months later. Before selection of demonstration sites, WEC will discuss the possible sites with RCG/Hagler, Bailey to determine how both organizations could jointly work at the same site.

8. Program Components

The WEC cooperation in industrial pollution prevention can be undertaken through a program that will include:

- introducing monitoring and process equipment and technical assistance
- providing in-depth, recurrent technical assistance and training in no cost/low cost pollution prevention and waste minimization activities
- holding a regional workshop on waste minimization and presentation of case studies from the selected industries

9. WEC Program Process and Site Selection

In the initial phase, after a technical evaluation of equipment needs and benefits, WEC will purchase, provide and assist the plants to install some monitoring/measuring equipment that will help demonstrate economic and environmental benefits. Two U.S. specialists will visit selected plants and specify the required monitoring/measuring equipment. It is estimated that the selected specialists will spend one week at each plant and provide WEC, the plants, and the Government of Romania with recommendations.

The selection of industries will be based on the plant management's independent initiative to try and ensure the company's economic future. All plants visited have major pollution problems. The managers in each plant expressed a strong desire to eliminate their pollution problems. In the absence of government participation at the current time, the desire and degree of determination to succeed demonstrated by the plant managers will be a major consideration in selection of the company.

The selected industries agreed to sign a one year memorandum of understanding with the WEC.

All assessments will be jointly undertaken by WEC specialists, several Romanian environment plant engineers, and one to two technical specialists from the Romanian engineering or technical sector. The purpose of this joint team effort is to strengthen the Romanian expertise to undertake these assessments and support the development of a private sector environmental services capabilities. The assessments are anticipated to take approximately two weeks.

Two committees will be established at each enterprise and operate for the duration of the waste minimization demonstration. An oversight committee comprised of WEC specialists, senior management of the selected industry, and senior management of other enterprises in the selected region will guide the overall demonstration. A waste minimization committee comprised of WEC specialists, local consulting firms, enterprise managers, and workers from the plants relevant departments will implement the demonstration.

10. Publicity

WEC, in conjunction with the office of USAID/Bucharest, the enterprises, and the Romanian government will provide publicity during the demonstration. The objective of the publicity will be to inform the general public and non-government organizations about the purpose and results of the waste minimization program. It is anticipated that the publicity will consist of press releases, a brochure describing the program, interviews with enterprise managers, USAID office representatives, and Romanian authorities.

Publicity will start when the U.S. equipment arrives, signalling the start of the demonstration. Publicity for the environmental assessments could include press releases and seminars.

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