



USAID | **SERBIA**
FROM THE AMERICAN PEOPLE

Contract Number: 169-C-00-11-00102

Project: Sustainable Local Development Project in Serbia

Contractor: Chemonics Inc.

USAID COR: Mr. Sinisa Cadjo

Issuance Date: July, 2015

Document Title: EMMP for Installation of Ozone Technology Denim Finishing Equipment for the Novi Pazar Jeans Sector

Author: Chemonic International Inc



ENVIRONMENTAL REVIEW CHECKLIST
FOR
IDENTIFYING POTENTIAL
ENVIRONMENTAL IMPACTS
OF PROJECT ACTIVITIES AND
PROCESSES

for: Installation of Ozone Technology Denim
Finishing Equipment for the Novi Pazar Jeans
Sector

Implemented under: Sustainable Local
Development Project
(SLDP)

DCN: 2013-SRB-022

Prepared by: Chemonics International

Inc.

ENVIRONMENTAL REVIEW CHECKLIST FOR IDENTIFYING POTENTIAL ENVIRONMENTAL IMPACTS OF PROJECT ACTIVITIES AND PROCESSES

The Environmental Review Checklist for Identifying Potential Environmental Impacts of Project Activities and Processes (ERC) is intended for use mainly by implementing partners to: assess activity-specific baseline conditions, including applicable environmental requirements; identify potential adverse environmental effects associated with planned activity(s) and processes; and develop environmental mitigation and monitoring plans (EMMPs) that can effectively avoid or adequately minimize the identified effects. This ERC can also be substituted for other ERC versions that may have been attached to project initial environmental examinations (IEE). If implementing partners are in doubt about whether a planned activity requires preparation of an ERC, they should contact their Contracting Officer's Representative (COR)/Agreement Officer's Representative (AOR) for clarification.

A. Activity and Site Information

Project Name: <i>(as stated in the triggering IEE)</i>	Sustainable Local Development Project (SLDP)
Mission/Country:	Republic of Serbia
DCN of Triggering IEE:	2013-SRB-022
Activity/Site Name:	Novi Pazar
Type of Activity:	Installation of ozone technology denim finishing equipment
Name of Reviewer and Summary of Professional Qualifications:	
Date of Review:	

B. Activity Description

1. Activity purpose and need

The USAID Sustainable Local Development Project (SLDP) is a five-year program designed to support Serbian local governments, businesses and civil society organizations to increase their efficiency and achieve economies of scale through Inter-Municipal Cooperation (IMC) aimed at accelerating economic growth. SLDP's core activities are focused on supporting inter-municipal partners to expand the private sector, add jobs and reduce unemployment in regional economies. Within the SLDP, the eight IMC partnerships have been established by 32 local governments. Accordingly, SLDP has developed eight sector specific inter-municipal programs, one for each of the eight established IMC partnerships, which will proximately add jobs to IMC areas by expanding their private sectors. These inter-municipal programs were identified under a set of SLDP, business-oriented criteria, and their execution includes all three following components of SLDP:

1. Inter-Municipal Cooperation Programming
2. Public Administration Reform
3. Youth Development and Participatory Mechanism

Background

The driving force of the Sandzak economy has been for decades the textile industry, which has absorbed a large number of workers. In the early and mid-1990s, the textile industry in Novi Pazar experienced a boom as a result of the collapse of large state-owned textile clothing factories. During the 1990s, the Novi Pazar area alone had over 200 successful small and medium sized businesses engaged in jeans manufacturing. As a result, Novi Pazar became the major jeans manufacturing center in Serbia and one of the largest in the Balkans. It was referred to as the “textile wonder from Serbia”. Approximately 90% of textile products from Serbia in that period were made in Novi Pazar. The last 10 years have seen a decrease in number of textile factories and businesses and consequently a decrease in the number of people working in textile factories. The result of this decline leaves Novi Pazar with one of the highest unemployment rates in Serbia at around 50%. Regrettably, only the most robust textile companies managed to survive that decline.

In the present day, more than thirty family-owned denim factories in the Novi Pazar area employ more than 9,000 workers. Most of these factories sell their products under their own brand name, both in domestic and foreign markets, but they are also capable of subcontracting to the finest jeans brands in the world. Over 80% of their production is exported, and the combination of sophisticated manufacturing and high quality product gives great potential for significant sector growth. A recent assessment of a denim industry expert sponsored by USAID’s Project on Sustainable Local Development (SLDP) indicates that given market demand for new manufacturing sources, the Novi Pazar denim sector could expand its employment base by three times if appropriate firm-based measures were taken to increase the sector’s global competitiveness.

The Environmental Problem

All competitive jean-manufacturing companies must wash prior to the final stage of production. As an integral part of the manufacturing process, factories in Novi Pazar have installed technology lines for chemical treatment and preparation of textile materials, clothing processing, garment washing, drying, bleaching, and stoning clothes. During the textile fabrics and garments finishing processing, dangerous and harmful effluents are generated and released, untreated, directly into the Raška River (the recipient). Technological and chemical methods used by all Novi Pazar denim producers to achieve a desired vintage look for the jeans are in violation of the Serbian environmental regulation.

Some jeans firms that have partially solved the problem of waste water by mostly using separation pools that separate solid waste (stones); however, Novi Pazar manufacturers possess no system for purifying “blue water”. The problem threatens the entire industry. All members of the ASSTEX, association/cluster of the Novi Pazar textile producers, were subject to inspection by national Inspectors for Environmental Protection in 2010. All producers are in a so-called “legal grey zone” as Inspectors for Environmental protection tolerate this situation.

The findings of the inspections performed are as follows:

1. It must be ensured that industrial waste water, i.e. waste water generated in the process of exploitation and treatment of textile fabrics and garments, which is, following the finishing processes, discharged directly into the river or city sewage system, be subjected to treatment;
2. Waste water pre-treatment plants must be constructed;
3. Physical and chemical analyses of waste water must be performed on a regular basis, and the results of

such measurements must be submitted to the competent inspection authorities.

Until this is completed, the manufacturers' operations are subject to closure at any time, and the producers may additionally be fined. The precarious situation is fully dependent on how tolerant the inspectors remain.

Compounding these challenges is the City of Novi Pazar itself discharges its untreated sanitary wastewater into the receptor river, the Raška, as it lacks a municipal wastewater treatment plant. The sewer system of the City of Novi Pazar is only partially constructed, and waste waters from urban areas of Novi Pazar are currently discharged, untreated, directly into the Raška river and its small tributaries.

To address the problem of channeling and treatment of waste water on the territory of the municipality of Novi Pazar, Genral Project D was developed in 2007 for collection, removal and treatment of waste water in the City of Novi Pazar, and different options for resolving the problem of waste water on the City territory were analyzed. This project, which focused on catchment area of the rivers of Raška, Ibar and Zapadna Morava, is of enormous significance for the entire population of the City of Novi Pazar and Southern Serbia alike. The General Project envisages construction of one waste water treatment plant for the City of Novi Pazar.

In 2010, the EU's Municipal Infrastructure Support Programme (MISP, performed by the Consortium Eptisa Group, Royal Haskoning and VNG) prepared a Feasibility Study for the construction of a wastewater treatment plant in Novi Pazar. The Feasibility Study calculated that the preliminary costs of the construction of the waste treatment plant with all necessary facilities would amount to as much as 26 million EUR. The Feasibility Study did not analyze the specific challenges related to environmental hazards caused by waste water pollution in specific sectors, including textile and jeans production, and did not contain technical/construction requirements for possible pre-treatment of waste water for those sectors. Financing of the central waste water treatment plant (WWTP) in Novi Pazar was put on hold due to the large anticipated costs in the Feasibility Study.

Even if a sufficiently large and equipped city-wide waste water management system were in place, however, jeans manufacturers would still be required to introduce pre-treatment of the industrial waste water they normally discharge into the public utility sewer system. Procurement of a commonly used ozone technology finishing machine would decrease the amount of tainted water discharged into production process because ozone finishing is dry, and does not include the pernicious characteristics of wet finishing with stones, repeated washings and introduction of dyes and chemicals. A vintage look finish can be achieved by ozone finish processing without any of the environmentally threatening steps of wet finishing.

It is true that pre-finishing washing would still involve improper discharge of tainted water; however, if dry finishing through ozone has the expected effect of increasing the revenue and market share of the manufacturers, they will eventually have the funds to install filter systems for pre-finishing also. The manufacturers have agreed with SLDP to approach the national government and negotiate staged full compliance with environmental rules, starting with ozone finishing and ending with pre-wash filtration. The economic health of the sector depends on this.

Detailed description of requested assistance

The requested assistance is to be provided to a group of six denim jean manufacturers in and around the City of
Mission / Project

Novi Pazar, Serbia. Specifically, this group, which has been legally formed into an Association of jean manufacturers, has requested that SLDP provide the Association with ozone technology equipment for finishing denim jean products. The equipment will be procured by SLDP in the United States, and all costs of procurement and delivery will be borne by Project funds. The equipment, once delivered, will be owned by the Association, and will be managed and administered by a special management Operation Unit in charge of operating the equipment and ensuring fair procedures for the equipment to be shared and utilized by multiple manufacturing firms producing denim jean products in the region of Novi Pazar. The Operation Unit will be financed and regulated by members of the Association, consistent with rules and procedures established by the members of the Association.

The equipment itself will be a self-contained and stand-alone industrial grade machine for finishing denim jeans through ozone technology. Ozone finishing is known as dry-finishing and contrasts with more traditional finishing techniques based on repeated washings. Ozone technology harnesses the natural bleaching capabilities of ozone gas to give a range of overall and specialty bleach effects to denim products, with substantially reduced environmental impact owing to reduced use of water and energy. Ozone can be used to clean pocket back staining after normal washing processes, or to bleach denim to a lighter shade. The technology process is that jeans are dampened, exposed to ozone that has been converted from oxygen to ozone gas in a sealed ozone chamber, and then rinsed in a washer and dried. The ozone in the sealed chamber is then reconverted to ordinary oxygen before release back into the atmosphere. The chemical process by which ozone finishing works is the reaction of ozone, moisture, and the indigo dye in combination, which allows for the 'bleaching', or more correctly 'oxidation', process and effects. The free radicals in the ozone, in combination with the moisture content, oxidize the color molecules in the indigo dye. This oxidation process of the indigo dye molecules produces organic radicals that are then dissipated with the remaining ozone molecules through the ozone destruct system.

The specific production steps that will be taken with regard to the ozone equipment under review are as follows. Denim jeans will be assembled and fully washed at the individual factories that are members of the Association or are permitted by the Association to utilize the equipment. In that pre-washing, dyes and chemicals will be present in the wastewater. Those pre-washed jeans will then be delivered to be finished in the ozone facility run by the Operation Unit. Those jeans will either be completely dry when they are subjected to ozone finishing, or will have discrete and limited moisture spots, depending on the finishing design. After the ozone gas has bleached the jeans, the jeans will be lightly rinsed and dried, and will be re-delivered to the respective factories for final processing. The jeans processed in the ozone machine will emit no dyes or chemicals into the ozone machine or the water coming from the ozone machine. Any excess water from the ozone process, after rinsing and drying, will be clean water that is chemically and dye-free, and will be drained into the Municipality's water system. The ozone finishing process is a replacement process for traditional wet finishing, and factories using the ozone equipment will use less water overall. Experience with ozone finishing processes in use today indicates that such equipment decreases a manufacturer's water usage by as much as 50% per unit of production. By reducing overall water usage for finishing jeans, the overall finishing of Novi Pazar jeans will use fewer chemicals and dyes, as ozone is an alternative to the use of dyes and chemicals for obtaining desired finishing effects. In the case of Novi Pazar manufacturers, this "eco-friendly" finishing technique will provide a marketing edge to solicit eco-conscious buyers of denim jeans. The capacity of the machine proposed for procurement is 2,000 pairs of jeans/ day shift. This naturally exceeds the current demand the Association manufacturers have for dry finishing and will continue to be in excess of need as they expand into this eco market, but the advantage is that the equipment's volume parameters provide ample room for growth, as well as space for other, smaller companies to utilize the equipment. Over time, as the denim producers expand their production to meet increased demand generated by their new comparative advantage in state-of-the-art finishing,

their revenues will increase, and SLDP fully expects that a number of the individual companies will find it in their interest to purchase their own, ozone technology denim finishing machines or contribute to the expansion of the existing facility. Another environmental and business benefit of increasing use of ozone technology in Novi Pazar is that in summer, there is often a shortage of water in the area, and manufacturers need to restrict their wet finishing manufacturing. Use of ozone technology will ameliorate production difficulties encountered by water limitations.

Finally, it should be noted that the efficiency of the ozone machine and its capacity to produce uniform goods that meet production specifications, will be a competitive advantage for producing the cost of jeans per unit. Even more to the point, however, is that dry-finishing will give the manufacturers a competitive advantage in the eco-jean market, which is growing and is a way for Novi Pazar manufacturers to differentiate their production from Turkey and other bigger producing regions. That market is more forgiving in price, as it looks more for quality and reliability. Ultimately, SLDP's experts believe that by penetrating this market niche, the manufacturers can grow their sales and as a consequence will expand and hire new employees.

Implementation timeframe and schedule

Procurement and installation of the ozone technology equipment is scheduled for delivery in the late summer, 2015. A tender has been made and a preliminary selection of the winning vendor has been made. SLDP will make the formal award as soon as USAID approvals, including environmental approvals, are received.

2. Location of activity

The equipment will be installed in industrial-grade and zoned premises in Novi Pazar, Serbia. The premises have been selected by the Association members according to convenience considerations to optimize joint usage, as well as safety and size of factory floor conditions. The site where the ozone machine will be housed is currently part of the Denis d.o.o. (Denistar Jeans) factory complex. Denistar Jeans is one of the Association members. Its exact location is Save Kovacevica street, near the main road E-761. The premises are now used as a warehouse and are rated for industrial usage by virtue of presence in an industrial zone. The building is solid construction industrial space with an industrially rated power supply.

C. Activity-Specific Baseline Environmental Conditions

1. Population characteristics

Novi Pazar City has about 117,000 inhabitants, if one includes estimated unregistered inhabitants and residents of the larger urban area, which includes a number of smaller villages and settlements. Almost 80% of the residents are Bosniak Muslims, and a substantial portion of those, as much as 40% by some estimates, are minors.

2. Geography and Climate

The City of Novi Pazar is located at about 290 km south of Belgrade, along the regional road M 22 (Ibarska road) leading to Podgorica and the Adriatic Sea.

Novi Pazar is located the southwest of Serbia and lies in the Raska River valley, in rough and hilly country. The town is surrounded by steep mountains, the high lands of Golija and Rogonza Mountains, as well at the Pešter Plateau. The City itself occupies a valley whose altitude approaches 500 m.

Climate is characterized by four distinct seasons, with cold and snowy winters and hot, dry summers that often cause seasonal water shortages.

3. Natural resources, e.g., nearby forest/protected areas, ground and surface water resources

The main rivers in the Novi Pazar environs are the Jošanica, Raška, Deževska and Ljudska rivers. The above-mentioned river Raska runs through the town. There are also surrounding forests on the mountains, most of which are protected and not commercially used, and almost all of which are “clean” in that there has never been industrial or agricultural usage.

4. Current land use

The site where the ozone machine will be housed is currently part of the Denis d.o.o. (Denistar Jeans) factory complex. Denistar Jeans is one of the cluster members. Its exact location is Save Kovacevica street, near the main road E-761. The premises are now used as a warehouse and are rated for industrial usage by virtue of presence in an industrial zone. The building is solid construction industrial space with an industrially rated power supply.

5. Proximity to public facilities, e.g. schools, hospitals, etc.

The nearest public facility is approximately 1000 m or 1 kilometer distance from the factory premises.

D. Legal, Regulatory, and Permitting Requirements

1. National environmental impact assessment requirements for this activity.

There is no national environmental impact assessment requirement that cover a machine used internally on a factory floor that emits no substances into the air or water supply. The ozone technology equipment that will be procured by SLDP is precisely such a machine, and is desirable for the very reason that its utilization does not entail the emission of any chemicals or dyes into the environment. Any drainage from the rinsing process of the ozone machine will be clean water, not chemically infused, and not dye-infused, as dyes are not used in finishing ozone-based processes, and any indigo dyes will be washed out of the jeans when are pre-washed at individual factories before being sent to the ozone facility. The clean water from the ozone rinsing process will be drained into the Municipality’s sewage system for industrial sites. Chemically, the ozone process does not fade jeans and wash out indigo dyes, and it does not release liquidated dyes. Rather, the ozone process is the chemical reaction of ozone, moisture, and the indigo dye in combination, which allows for the 'bleaching', or more correctly 'oxidation', process and effects. The free radicals in the ozone, in combination with the moisture content, oxidize the color molecules in the indigo dye. This oxidation process of the indigo dye molecules produces organic radicals that are then dissipated with the remaining ozone molecules through the ozone destruct system. There is accordingly no need for an environmental impact assessment under the national legislation of Serbia or the United States.

2. Applicable National or local permits for this activity, responsible party, and schedule for obtaining them:

No permits are necessary for installation of the ozone technology equipment to be procured. Under Serbian law, there are local permits required for allowing manufacturing processes in an urban area, and

all such permits and manufacturing requirements and allowances have been obtained for the premises in which the machine shall be installed.

Permit Type	Responsible party	Schedule
Zoning	-	-
Building/Construction	-	-
Source Material Extraction	-	-
Waste Disposal	-	-
Wastewater	-	-
Storm Water Management	-	-
Air Quality	-	-
Water Use	-	-
Historical or Cultural Preservation	-	-
Wetlands or Water bodies	-	-
Threatened or Endangered Species	-	-
<i>Other</i>		-

- 3. Additional National, European Union, or other international environmental laws, conventions, standards with which the activity might be required to comply**
- Air emission standards- NOT APPLICABLE
 - Water discharge standards- NOT APPLICABLE
 - Solid waste disposal or storage regulations- NOT APPLICABLE
 - Hazardous waste storage and disposal- NOT APPLICABLE
 - Historical or cultural preservation- NOT APPLICABLE
 - Other- None

Although none of the above regulations is applicable to or affected by the proposed installation of the ozone technology denim jeans finishing machine, the manufacturers of denim jeans in Novi Pazar are of course subject to Serbian water discharge standards concerning other aspects of their operations. At the current time, all manufacturers solely use wet/wash jean finishing techniques, which necessitates substantial discharge and emissions of chemically infused water into the public sewage system or into the rivers directly. The ozone technology that SLDP is introducing is a dry-finishing process designed to decrease or eliminate the use of water while finishing jeans. To the extent the Association members adopt this new technology, they will decrease their use of water (international experience shows that that amount could be 50%) and thereby substantially cut any potential environmental impact. In addition, any water that is drained from the ozone equipment itself will be clean water, not chemically infused. Naturally, the manufacturers will need to comply with regulations concerning water that they still use in other wet processes of denim jean finishing, as has always been their obligation.

E. Engineering Safety and Integrity

- Will the activity be required to adhere to formal engineering designs/plans?** The ozone technology equipment must be installed and operated as per the manufacturer's instructions. At the current moment, because the procurement is not formally awarded, we are unable to specify the installation requirements that the vendor will require. However, the procurement terms call for full OSHA (Occupational Safety and Health Administration) compliance for manufacturing workplace and equipment. Also, the manufacturer will provide trainings to operators of the equipment, as per the procurement tender. The equipment should not be modified in any way, once it is installed by vendor representatives.
- Have these been or will they be developed by a qualified engineer?** One of the terms of reference for the procurement is that the original equipment is to have been designed to meet United States OSHA

(Occupational Safety and Health Administration) standards. The procedures for usage of the equipment will have been developed by the manufacturer's designers and engineers.

3. **Do designs/plans effectively and comprehensively address:**
 - a. Management of storm water runoff and its effects? NOT APPLICABLE.
 - b. Reuse, recycling, and disposal of construction debris and by-products? NOT APPLICABLE.
 - c. Energy efficiency and/or preference for renewable energy sources? The equipment is designed to decrease water usage and electrical consumption by the user of the equipment.
 - d. Pollution prevention and cleaner production measures? The equipment is designed to utilize cleaner production measures.
 - e. Maximum reliance on green building or green land-use approaches? NOT APPLICABLE.
 - f. Emergency response planning? The equipment must have built-in computerized lock-down mechanisms for preventing the escape of ozone into the atmosphere in the event of mis-utilization of the machine.
 - g. Mitigation or avoidance of occupational safety and health hazards? The terms of reference for procurement of the machine require a design for OSHA compliance.
 - h. Environmental management of mobilization and de-mobilization? NOT APPLICABLE.
 - i. Capacity of the host country recipient organization to sustain the environmental management aspects of the activity after closure and handover? The recipient will be trained in the usage of the ozone equipment and will have adopted standard operating procedures for maintaining the environmental integrity of the machine and its utilization. The market of international buyers of jeans produced with ozone technology will also act as a compliance check on the environmental integrity of how the machine is being used.
4. **Are there known geological hazards, e.g., faults, landslides, or unstable soil structure, which could affect the activity? If so, how will the project ensure structural integrity?** The equipment is stand-alone industrial machinery to be housed inside premises that are designated for production and manufacturing under the provisions set forth in applicable Serbian legislation (e.g., land use, building safety, fire codes, etc.)
5. **Will the site require grading, trenching, or excavation? Will the activity generate borrow pits? If so, how will these be managed during implementation and closure?** NO, there is no outdoor construction envisaged in this activity.
6. **Will the activity cause interference with the current drainage systems or conditions? Will it increase the risk of flooding?** NO.
7. **Will the activity interfere with above- or below-ground utility transmission lines, e.g., communications, water, sewer, or natural gas?** NO the facility is already fully connected according to municipal codes for industrial space.
8. **Will the activity potentially interfere with vehicle or pedestrian traffic?** NO
9. **Does the activity increase the risk of fire, explosion, or hazardous chemical releases?** NO to the extent that the equipment is used as prescribed by the vendor and in compliance with the training instructions of the vendor.
10. **Does the activity require disposal or retrofitting of polychlorinated biphenyl-containing equipment, e.g., transformers or florescent light ballasts?** NO

F. Environment, Health, and Safety Consequences

1. Potential impacts to public health and well-being

- a. Will the activity require temporary or permanent property land taking? NO

- b. Will activities require temporary or permanent human resettlement? NO
- c. Will area residents and/or workers be exposed to pesticides, fertilizer, or other toxic substances, e.g., as a result of farming or manufacturing? NO—there will be no release of ozone gas into the atmosphere as a function of safety features inherent in the equipment that will be installed.
If so, how will the project:
 - i. Ensure that these chemicals do not contaminate ground or surface water? NOT APPLICABLE
 - ii. Ensure that workers use protective clothing and equipment to prevent exposure? NOT APPLICABLE
 - iii. Control releases of these substances to air, water, and land? NOT APPLICABLE
 - iv. Restrict access to the site to reduce the potential for human exposure? NOT APPLICABLE
- d. Will the activity generate pesticide, chemical, or industrial wastes? Could these wastes potentially contaminate soil, groundwater or surface water? NO
- e. Will chemical containers be stored at the site? NO, not as a result of the procurement or installation of this equipment. Chemical containers are not an element of ozone technology.
- f. Does the activity remove asbestos-containing materials or use of building materials that may contain asbestos, formaldehyde, or other toxic materials? Can the project certify that building materials are non-toxic? If so, how will these wastes be disposed of? NOT APPLICABLE
- g. Will the activity generate other solid or hazardous wastes such as construction debris, dry or wet cell batteries, florescent tubes, aerosol cans, paint, solvents, etc.? If so, how will this waste be disposed of? Not applicable
- h. Will the activity generate nontoxic, nonhazardous solid wastes (subsequently requiring land resources for disposal)? NOT APPLICABLE
- i. Will the activity pose the need to handle and dispose of medical wastes? If so, describe measures of ensuring occupational and public health and safety, both onsite and offsite. Not applicable
- j. Does the activity provide a new source of drinking water for a community? If so, how will the project monitor water quality in accordance with health standards? NOT APPLICABLE
- k. Will the activity potentially disturb soil contaminated with toxic or hazardous materials? Not applicable
- l. Will activities, e.g., construction, refurbishment, demolition, or blasting, result in increased noise or light pollution, which could adversely affect the natural or human environment? NOT APPLICABLE.

2. Atmospheric and air quality impacts

- a. Will the activity result in increased emission of air pollutants from a vent or as fugitive releases, e.g., soot, sulfur dioxide, oxides of nitrogen, volatile organic compounds, methane. NO
- b. Will the activity involve burning of wood or biomass? Not for this equipment
- c. Will the activity install, operate, maintain, or decommission systems containing ozone depleting substances, e.g., freon or other refrigerants? - NO
- d. Will the activity generate an increase in carbon emissions? - NO
- e. Will the activity increase odor and/or noise? NO

3. Water quality changes and impacts

- 1. How far is the site located from the nearest river, stream, or lake? The nearest river is about 200 m distance from the facility. Any drainage from the rinsing process of the ozone machine will be clean

water, not chemically infused, and not dye-infused, as dyes are not used in finishing ozone-based processes, and any indigo dyes subject to “washing out”, will be washed out of the jeans when pre-washed at individual factories before being sent to the ozone facility. Chemically, the ozone process does not fade jeans and wash out indigo dyes, or release any liquidated dyes. Rather, the ozone process is the chemical reaction of ozone, moisture, and the indigo dye in combination, which allows for the 'bleaching', or more correctly 'oxidation', process and effects. The free radicals in the ozone, in combination with the moisture content, oxidize the color molecules in the indigo dye. This oxidation process of the indigo dye molecules produces organic radicals that are then dissipated with the remaining ozone molecules through the ozone destruct system. The clean water from the ozone rinsing process will be drained into the Municipality’s sewage system for industrial sites. There is a rinsing process simply to rinse the jeans after finishing. The jeans that come to the ozone facility from the factories will most likely be damp; however, if you would ring them out, very little water would be emitted, and that water is free of indigo discharge because the ink that would normally be emitted from indigo in volumes occurs at the first washings in the factories. At the ozone facility, the jeans may be moistened again at various places on the jeans in order to get a finish effect. For instance, if a company wished to produce jeans that were spotted on the legs, they would moisten the jeans in spots and then put them into the ozone machine. The moistening slows the bleaching process of the gas, so jeans would be darker on the spots and lighter on the non-moistened areas under uniform time of exposure to the ozone gas. Alternatively, the factories may choose not to moisten any parts of their jeans, and just submit the jeans to different time periods of gas. After the jeans are exposed to the ozone and oxidation is complete, the jeans are rinsed before being sent back to the factories for pressing and shipment preparation. The water that comes from the rinsing process after the ozone treatment is fully clean—no indigo, no chemicals, and not much water because it is a rinsing, not a drenched washing process.

When we say a pair of ozone finished jeans is more ecologically desirable because it uses less water and no chemicals, we mean that the old finishing process of washing and stones involves repeated water usage and some additional chemicals and dyes to get the effect of a well-worn jean. Using an ozone machine to get the same effect on a pair of jeans involves less water (no repeated washings) and no chemicals or dyes because the well-worn effect is produced by oxidization, not water or coloring.

2. Will the activity disturb wetland, lacustrine, or riparian areas? NO
3. What is the depth to groundwater at the site? NOT APPLICABLE
4. Will the activity result in increased ground or surface water extraction? If so, what are the volumes? Permit requirements? NO
5. Will the activity discharge domestic or industrial sewage to surface, ground water, or publicly-owned treatment facility? Utilization of this equipment will not involve discharge of industrial sewage
6. Does the activity result in increased volumes of storm water run-off and/or is there potential for discharges of potentially contaminated (including suspended solids) storm water? NO
7. Will the activity result in the runoff of pesticides, fertilizers, or toxic chemicals into surface water or groundwater? NO
8. Will the activity result in discharge of livestock wastes such as manure or blood into surface water? NO
9. Does the site require excavation, placing of fill, or substrate removal (e.g., gravel) from a river, stream or lake? NO

4. Land use changes and impacts

- a. Will the activity convert fallow land to agricultural land? NO
- b. Will the activity convert forest land to agricultural land? NO

- c. Will the activity convert agricultural land to commercial, industrial, or residential uses? NO
- d. Will the activity require onsite storage of liquid fuels or hazardous materials in bulk quantities? NO
- e. Will the activity result in natural resource extraction, e.g., granite, limestone, coal, lignite, oil, or gas? NO
- f. Will the activity alter the view shed of area residents or others? NO

5. Impacts to forestry, biodiversity, protected areas and endangered species

- a. Is the site located adjacent to a protected area, national park, nature preserve, or wildlife refuge? NO
- b. Is the site located in or near threatened or endangered (T&E) species habitat? Is there a plan for identifying T&E species during activity implementation? If T&E species are identified during implementation, is there a formal process for halting work, avoiding impacts, and notifying authorities? NO
- c. Is the site located in a migratory bird flight or other animal migratory pathway? NOT APPLICABLE
- d. Will the activity involve harvesting of non-timber forest products, e.g., mushrooms, medicinal and aromatic plants (MAPs), herbs, or woody debris? NO
- e. Will the activity involve tree removal or logging? NO

6. Historic or cultural resources

- a. Are there cultural or historic sites located at or near the site? If so, what is the distance from these? What is the plan for avoiding disturbance or notifying authorities? NOT APPLICABLE
- b. Are there unique ethnic or traditional cultures or values present in the site? If so, what is the applicable preservation plan? NOT APPLICABLE

Further Analysis of Recommended Actions.

1. Categorical Exclusion: The activity is not likely to have an effect on the natural or physical environment. No further environmental review is required.* **This is what we feel should be marked**

2. Negative Determination with Conditions: The activity does not have potentially significant adverse environmental, health, or safety effects, but may contribute to minor impacts that can be eliminated or adequately minimized by appropriate mitigation measures. EMMPs shall be developed, approved by the Mission Environmental Officer (MEO) (and the BEO if required by the IEE) prior to beginning the activity, incorporated into work plans, and then implemented. See Sections G and H below.*

3. Positive Determination: The activity has potentially significant adverse environmental effects and requires further analysis of alternatives, solicitation of stakeholder input, and incorporation of environmental considerations into activity design. A Scoping Statement must be prepared and be submitted to the BEO for approval. Following BEO approval an Environmental Assessment (EA) will be conducted. The activity may not be implemented until the BEO clears the final EA. For activities related to the procurement, use, or training related to pesticides, a PERUSAP will be prepared for BEO approval.

4. Activity Cancellation: The activity poses significant and unmitigable adverse environmental effects. Adequate EMMPs cannot be developed to eliminate these effects and alternatives are not feasible. The project is not recommended for funding.

G. EMMPs

1. Activity-specific environmental mitigation plan (Upon request, the MEO may be able to provide your project with example EMMPs that are specific to your activity.)

Processes	Environmental	Do the Impacts Require Further Consideration	Mitigation Measures	Indicators
Procurement and use of equipment	Occupational safety	<p><i>Increase in risk of fire, explosion, or hazardous chemical releases if the equipment is misused or its use is pursued out of conformity with standard operating procedures.</i></p> <p><i>The foreseen adverse impact is less than significant. Certain mitigation measures are required.</i></p>	<p>Under the SLDP procurement terms, the winning vendor will supply vendor-certificated training for all operators of the ozone technology machine, and for all floor managers. The vendor, which is the direct manufacturer and inventor of the machine and which has installed such machines in multiple domestic and international venues belonging to the largest companies in the world, including Levi Strauss, will also be in charge of installation as part of the procurement price. The machines manufactured and installed by this vendor have a perfect safety record world-wide. In addition, mandatory operating procedures will be adopted by the Association acquiring the machine, in order to govern the conditions of its usage, the terms of its maintenance, the rules of inspection and the qualifications and suitability of its operators. The Association will hire a management team for the equipment, and will also follow rules of professionalism and work conduct that have been adopted by the Association to govern the teams of operators and managers who will administer the operation of the machine.</p>	
	Discharge of wastewaters	<p><i>Will the activity discharge domestic or industrial sewage to surface, ground water, or publicly-owned treatment facility? YES</i></p> <p><i>There is no foreseen significant adverse impact. No further environmental review required. Non-</i></p>	<p>Other operations inside the factories that will utilize the ozone machine will involve water use and disposal as has always been the case with the Novi Pazar factories. The Novi Pazar factories are obliged to, but do not yet follow all Serbian environmental rules that apply to water discharge</p>	

Processes	Environmental	Do the Impacts Require Further Consideration	Mitigation Measures	Indicators
		<p><i>the-less, certain mitigation measures may be applied.</i></p>	<p>and are actively engaged with the national government regulators to perfect their compliance with these environmental laws and regulations. At the current moment they are not in compliance with the emissions standards, and the water they emit without filtering from pre-washing is chemically and dye-content impure. The ozone machine is a first step in mediating the factories' non-compliance with emission standards; however, they will have to do more by installing pre-washing filtration systems in their own individual factories. We believe that the revenues they realize from dry-finishing and penetration of new markets will give them the capital for further investment in individual filtration systems. In addition, SLDP has been in discussion with other donors about funding such filtration systems if this first-step ozone machine shows the results we believe it will. As for this particular procurement, however, the ozone machine installation will not impact the compliance procedures or adversely affect the compliance of the manufacturers with the water discharge rules. Any drainage from the rinsing process of the ozone machine will be clean water, not chemically infused, and not dye-infused, as dyes are not used in finishing ozone-based processes, and any indigo dyes that will be washed out, will be washed out of the jeans when they are pre-washed at individual factories before being sent to the ozone facility. Chemically, the ozone process does not fade jeans and wash out indigo dyes. Rather, the ozone process is the chemical reaction of ozone, moisture, and the indigo dye in combination, which allows for the 'bleaching', or more correctly 'oxidation', process</p>	

Processes	Environmental	Do the Impacts Require Further Consideration	Mitigation Measures	Indicators
			and effects. The free radicals in the ozone, in combination with the moisture content, oxidize the color molecules in the indigo dye. This oxidation process of the indigo dye molecules produces organic radicals that are then dissipated with the remaining ozone molecules through the ozone destruct system. The clean water from the ozone rinsing process , which stems from a standard rinsing after any production process that involves chemical reactions such as oxidation, will be drained into the Municipality’s sewage system for industrial sites. In terms of total volume of production, the ozone technology will only decrease any impact that the producers might have on the environment in terms of water discharge from their overall finishing processes.	
	Atmospheric and air quality impacts	<p><i>Will the activity result in increased emission of air pollutants from a vent or as fugitive releases, e.g., soot, sulfur dioxide, oxides of nitrogen, volatile organic compounds, methane. NO</i></p> <p><i>There is no foreseen significant adverse impact. No further environmental review required. Does not pose the risk due to low capacity of the equipment and insignificant emission of air pollutants.</i></p>		

2. Activity-specific monitoring plan

Monitoring Indicators	Monitoring and Reporting Frequency	Responsible Parties	Records Generated
Audit of equipment attests and certificates	Upon procurement, SLDP and Association owners will review all equipment specifications with manufacturer of	SLDP; Association Leaders; Manufacturer;	Annual report on maintenance checklist

Monitoring Indicators	Monitoring and Reporting Frequency	Responsible Parties	Records Generated
	equipment. A maintenance checklist will be drawn up, providing for periodic inspections and certifications by unit in charge of operating machine.	Operating Unit of Machine	generated by unit in charge of operating machine and delivered to Association leadership.
Provided training on safe handling and use of equipment completed.	Under terms of procurement, the manufacturer will provide training for all personnel employed by the Operating Unit. A unit manager, appointed by the Association, will be in charge with working out a continuing training and readiness schedule for unit employees. Such a schedule will be a product of consultation with the manufacturer. The manufacturer will maintain a 24 hour hot-line to enable the operating unit to contact the manufacturer's specialists and troubleshoot the machine.	SLDP; Manufacturer; Association; Operating Unit of Machine	Memo reflecting initial training by Manufacturing and topics covered and emphasized; Schedule for re-training and readiness of operators and members of Operating Unit.
Developed procedures and protocols on safe handling and use of equipment	As part of the agreement between SLDP and its beneficiary Association, the Association leaders will develop a manual of protocols governing the usage and maintenance of the machine. This will include personnel policies for the members of the Operating Unit, cost sharing obligations among the Association members, principles of joint usage of the machine, normative schedules for usage of the machine, responsibilities for utilization of the machine in compliance with manufacturer's instructions, procedures for delivery and removal of denim loads from the machine and premises in which the machine is housed, maintenance steps to be periodically taken, and any other protocols or procedures necessary to the optimal and safe usage of the machine, including reporting on machine readiness, utilization and maintenance.	Association Leaders; SLDP	The described Manual, which has descriptions of how to guarantee that automatic, computer-based emergency shut-down has been triggered and the machine is shut-down.
Premises where the machine is housed will be maintained to, and comply with, Serbian and best practice industrial standards for manufacturing facilities producing denim jeans.	The manual described above to be created by the Association will set forth the industrial standards, including worker health and safety, to which the premises and working conditions of the facility housing the machine will comply. Compliance with such standards will be checked semi-annually and certified as fulfilled by the Operating Unit to the Association Leaders.	Association Leaders; SLDP; Operating Unit	The described Manual and compliance certification
Equipment disposal	The equipment has no periodic waste. Once its useful life	Association Leaders	None

Monitoring Indicators	Monitoring and Reporting Frequency	Responsible Parties	Records Generated
	has expired, the machine will be disposed of in accordance with Serbian standards of disposing of industrial machinery. The machine will have no hazardous materials at the time of disposal and can be scrapped for its metal, with the exception of its computer components that must be disposed of according to Serbian laws governing computer component waste.		

II. Certification of No Adverse or Significant Effects on the Environment

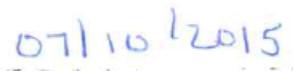
The undersigned certifies that all foreseeable significant adverse effects on the environment have been adequately and effectively eliminated or mitigated by the attached Environmental Mitigation and Monitoring Plans (EMMPs) to be implemented at DCN-SER-022. If new adverse effects or the need for new or improved mitigation measures are identified, I will immediately notify the USAID activity manager/COR/AOR.

Implementer Project Director/COP Howard Oakman	Date
---	------

I. Approvals:

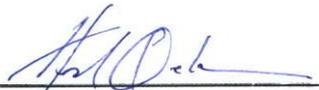
 _____ USAID COR/AOR, Sinisa Cadić	 _____ Date
---	---

 _____ PAL Mission Environmental Officer, Ivan Vukojevic	 _____ Date
---	---

 _____ Bureau Environmental Officer, Mack Kanya	 _____ Date
--	---

II. Certification of No Adverse or Significant Effects on the Environment

The undersigned certifies that all foreseeable significant adverse effects on the environment have been adequately and effectively eliminated or mitigated by the attached Environmental Mitigation and Monitoring Plans (EMMPs) to be implemented at DCN-SER-022. If new adverse effects or the need for new or improved mitigation measures are identified, I will immediately notify the USAID activity manager/COR/AOR.



Implementer Project Director/COP
Howard Oskman

07/13/2015
Date

I. Approvals:



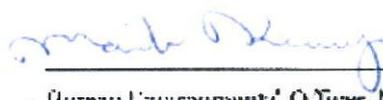
USAID COR/AOR, Sinaisa Cadje

08/22/2015
Date



P&L Mission Environmental Officer, Ivan Vukojevic

07/20/2015
Date



Bureau Environmental Officer, Mack Kanya

07/10/2015
Date