

MANAGEMENT PLAN FOR ENVIRONMENTAL PROTECTION

1. GENERAL INFORMATION ABOUT THE PROJECT AND DESIGN SITE

This subproject provides for the conversion of the former workshop for the workshop for the production of curb stone, paving tiles and hollow bricks without changing the carrying capacity of building structures.

1.1. Description of the project

Subproject name: «Innovative technologies of use of solid industrial waste of thermal power plant and metallurgy in Pavlodar region in the production of building materials». **Project location:** The enterprise is located in Pavlodar, in the Central Industrial District, building 826. The site is bounded on all sides by neighboring enterprises, such as PF «ATP-Invest» LLP, Krovelnyi Centr, «Monitoring bezopasnosti» LLP. The nearest residential zone is Pavlodar city at a distance of more than 3 km.

The aim of the project: Installation of equipment for production of building materials: curb stone, paving stone and hollow brick.

The installation of complex «Rifey-Udar» Is required for the production of building materials. The purpose of this complex is obtaining various construction products made of hard concrete mixtures by vibrocompression. The starting material for the preparation of the mixture is filler, binder and water. Calculation of materials for the technological process of production of building products, the ratio of components:

- Cement – 30 %
- Sand – 40 %
- Ash and slag waste (filler) – 30 %
- Superplasticizer C-3 – 1 % by weight of cement
- Water

Cement is used as the main binder. As a filler, sand and mixtures, ash and slag waste from thermal power plants will be used. Water used for the preparation of concrete, provides the hydration (grasping) of cement. As additives for hardening accelerators, the superplasticizer C-3, which is 1–3 % by weight of cement, will be used. This additive increases the strength of concrete at the age of 3 days in 2–4 times. Functionally, the entire production complex is divided into two parts: a mixture preparation system and a forming block. Each of the two parts is controlled by its operator, one workstation is located at the control panel of vibropress, the second – at the mixer. The mixture preparation system includes a mixer dispenser installed on the mixer. The conveyor with the support in the form of a rack serves to feed the finished mixture into the hopper of the loading module. The electric motors of the mixer and the conveyor are controlled from the control panel with the help of start-protection equipment located in the power cabinet.

The core of the molding block is a vibratory press, on which the module for loading the mixture is fixed and the module for feeding pallets is docked.

The rack is mounted on the pallet feed module. For six moldings, the rack is filled with pallets with freshly formed products and by means of a lifting device it is necessary to replace it with a rack with empty pallets.

The complex can be operated and stored in enclosed premises or under a canopy at an ambient temperature of +5 to +45 ° C. The minimum area required to accommodate the complex, warehouses of raw materials and finished products is 250 m², the minimum lifting height of the hook lifting equipment is 3 m. The sets of replaceable forming equipment (matrix-punch) allow us to produce a wide variety of construction products for a wide range of uses. The range of products is constantly replenished with new samples, while the consumer's wishes are limited only by the area of the 800x400mm forming zone and the product height 50 – 230 mm. The level of total vibration at the operator's workplace: less than 1/2 sanitary standards (not subject to normalization and control during manufacture and operation in accordance with GOST 12.1.012– 90).

The volume of production of building products per year in tons

- hollow brick – 16,755 t (598,400 PCs/year)
- curb stone – 7,590 t (126,500 PCs/year)
- paving tile «rectangular» – 4,462 t (49,580 m²/ year)

The number of working days in the year 300, single-shift operation for 8 hours. Number of employees for the period of work is 4 people, for the period of operation is 6 people.

Volume of bulk materials overspill

Table 1

Name of material	Number of materials per day of work (8 hours)	Number of materials per year of work
Cement – 30 %	24,192 t	7257,60 t
Sand – 40 %	32,256 t	9676,8 t
Ash and slag and other wastes (filler) – 30 %.	24,192 t	7257,6 t
Water	7, 26 m ³	2178 m ³ .
Superplasticizer C-3-1 % by weight of cement	0,242t	72,6 t

The composition and capacity of bins for storage of materials (at the rate of not less than three-day's supply of materials)

One 25m³ bunker is designed for the storage of cement of 32 t. Two bunkers on 25m³ is designed for storage of fillers total of about 35-40 tons. Sand will be stored in a closed room inside the shop in an open container (fenced area). Area for storage of sand 10x10=100m². Storage of superplasticizer will be in a closed room inside the shop in bags of 30 kg (packing delivery) – 24 bags for three days.

3.2 The technology of manufacturing of construction products Description of the complex operation

During motor operation, leading drum drives the conveyor belt, which through the open discharge door of the mixer and the funnel gets the concrete mixture and is moved to the hopper of the press.

The initial state of the nodes of the machine: the matrix in the upper position, the punch in the topmost position, on the table there is an empty pallet.

When exposed to the handle of the joystick «Matrix down» the matrix is lowered to the pallet and presses it to the table.

After loading the mixture into the matrix (accompanied by the switching-on of the vibrating table for a certain time), the punch drops down and the final molding of the products in the matrix takes place under the combined effect of vibration and punch pressure.

Without lifting the punch from the freshly molded products, the matrix rises upwards. Stripping of products occurs directly on the pallet. When the products are freed from the matrix, its further movement up to the initial state occurs together with the punch.

After changing the pallet with the products on the empty, the cycle of work is repeated.

The order of the complex operation

Turn on from the control panel of the transporting machine, which feeds the necessary filler into the compartment of the dispenser of the components. Fill the dispenser compartment to the required value. Simultaneously with this operation, switch on the auger conveyor feeding cement into the binder compartment of the binder. The filling of the dispenser compartments is controlled by the operator visually, the feeder is switched off manually by the operator.

Turn on the mixer motor, open the filler hopper flaps, then apply the binder. After a minute, apply a portion of water to the mixer. Mixing cycle is for at least 2 minutes. Humidity control should be performed using a viewing door located on the dispenser of the components.

The control must be carried out only with the mixer motor switched off.

Turn on the mixer before opening the mixer discharge port. Then open the discharge door until it stops, apply the mixture to the tape.

Once the amount of the mixture is sufficient for molding in the bunker of the loading module, it is necessary to turn on the pump unit and bring the vibrating press units to their original state. The matrix is in the uppermost position (palette change is possible), the punch is above the matrix, there is an empty pallet on the table.

Move the matrix to its lowest position.

Raise the punch up until the rod touches the stops. With the correct position of the restraint bar, the brush of the loading box must move the sticky particles of the mixture from the working surface of the punch during movement.

Set the pre-stacking time on the time switch. It should be remembered that the increase in time allows more mixture to get into the matrix, decrease - on the contrary. The time of preliminary laying is the operative lever for controlling the height of the molded products, usually the holding limits are 1.0 ... 3.0 s for paving slabs and 2.0 ... 6.0 s for wall stones. For the time of preliminary laying, the moisture content of the mixture also has a noticeable effect. The excessively moistened mixture increases the time of pre-packing, since the matrix is filled up worse, voids can be formed, causing defects in finished products.

Move the boot box with the mixture to the matrix. It is necessary to push the boot box all the way to the front. In this position, press the pedal of switching-on vibrating table, the mixture from the box will begin to fill the matrix.

To facilitate filling a mixture of matrices of complex shape, the active loading mode is provided. If during the preliminary laying continue to hold the handle distributor "left", the activator mixture will reciprocate simultaneously with the inclusion of the vibrating table. This mode ensures an even distribution of the mixture over the entire area of the matrix and excludes the formation of a vault over the voids of the matrix.

After stopping the vibrating table, reverse the movement of the handle, it is necessary to return the loading box to the stop under the hopper. In this case, the jawbolt will open, and the box will be filled with a mixture.

Then lower the punch before contact with the mixture. At this moment, the shaker is turned on with the pedal, the molding of the products begins. Without releasing the handle and holding the pedal, it is necessary to wait for the automatic shutdown of the vibrating table. It turns off when the preset height sensor is triggered (the indicator on the control panel lights up). For high-quality molding, the vibration time should be 7-10 seconds, this is achieved by selecting the pre-stacking time. Molding more than 15 s. practically does not lead to a change in the height of products, but only breaks them.

After disconnecting the vibrating table, return the handle to the neutral position with a punch and only then release the pedal. Violation of the sequence of actions leads to the destruction of products during the extraction.

After the vibrating table has completely stopped, proceed with pressing out the products from the die. To do this, move the matrix up. Climbing up, the matrix will come off the products and rests against the punch. At this point, without releasing the handle "matrix up", press the handle "punch up" and raise the die together with the punch to a height sufficient to change the pallet.

Next, move the pallet with the products to the pallet feed module. In this case, the pallets move one position to the rack, the rate of the pallets supply is regulated by the amount of the shift (tilt) of the handle. Controlling the speed of the flow of pallets - visual. The speed should be such that the destruction of the freshly formed products does not occur. Too high speed and sharp impacts when moving pallets with freshly formed products will lead to its destruction.

When the handle is moved back, the empty pallet will fall onto the table and the cycle will repeat.

After six pallets with finished products are on the rack, it is necessary to move it to the place where the products are stored by means of a lifting device, and a new rack with pallets should be installed on the pallet module.

1.2 Legislation and administration

National legislation Re-equipment of this workshop will be carried out within the framework of the following by-laws and legislative acts:

1. Environmental Code, 2007
2. Instruction on conducting an assessment of the impact of planned and other activities on the environment in the development of preplanned, pre-project and project documentation dated June 28, 2007 No. 204-P
3. Sanitary rules «On the approval of hygienic standards for atmospheric air in urban and rural settlements» of February 28, 2015, No. 11036.
4. Law of the Republic of Kazakhstan of July 16, 2001 No. 242-II On architectural, town-planning and construction activities in the Republic of Kazakhstan.
5. Water Code of the Republic of Kazakhstan of July 9, 2003 No. 481-II
6. Land Code of the Republic of Kazakhstan of June 20, 2003 No. 442-II

1.3 Status of project documentation and permissions

Ownership of land is definitely based on an act of land No. 0342738. The land is privately owned. To start production it is necessary to conclude a non-departmental examination.

2. ENVIRONMENTAL DESCRIPTION (STATUS OF THE BASIC LINE)

General description of the environment on the project site

The climate of the region is sharply continental, characterized by inadequate and unstable yearly amount of precipitation with summer maximum, low air temperatures in winter with strong winds and insufficiently powerful snow cover, late spring and early autumn frosts, significant temperature fluctuations throughout the year.

The location area of the enterprise refers to the insufficiently provided atmospheric precipitation, the average amount of precipitation per year is 278 mm.

The wind regime is of a continental nature. The prevailing are the winds of the western, south-western and southern directions. Seasonal change of prevailing wind directions to the opposite is one of the main features of the climate.

The average annual wind speed is 4.5 m/s. The highest wind speed is observed in spring (up to 6.0 m/s). Often the wind force exceeds 15-20 m/s.

In warm weather, dust storms are observed, on average 2-6 days a month. The average wind speed varies from 4 to 10 m/s, the maximum exceeds 30 m/s. The winds of the predominant directions have higher speeds.

The greatest cloudiness is noted in the cold period of the year, when the probability of a cloudy sky is 40–70 %. The duration of sunshine in winter is small - 3-4 hours a day. In summer, the frequency of clear days increases to 70 % over the period. The whole area belongs to the zone of ultraviolet comfort.

Geomorphologically, the site is confined to the surface of the II-over-flood terrace of the Irtysh River. The surrounding area is characterized by a flat, steppe landscape with numerous enclosed solonchaks. The main relief of the site is level, and in the excavation due to the uneven selection of soils, the marks vary from 1 to 3 meters.

The terrain has a slope towards the north-west to the valley of the Irtysh River. The surrounding area is characterized by a flat, steppe landscape with numerous closed solonchak and lake basins, filled with salty and bitter-salty lakes.

The radioactive background of the Pavlodar region depends on natural radioactivity, on the impact of the Semipalatinsk nuclear test site, and on the influence of enterprises working with radioactive substances.

The natural radioactivity in the territory of the Pavlodar region averages 12-14 micro-roentgen per hour.

The object is located in an area subjected to anthropogenic impact since the 70s. Therefore, the state of the vegetation cover in the zone of the impact of the object is characterized by the absence of plant communities and a scant species diversity in the floristic composition.

Rare, endemic and listed in the Red Book plants in the area under consideration are absent.

The impact on the vegetation of the location of the site is permissible. The plot is free from greenery.

The site of the object is flat with loamy soils, poor vegetation cover and is unsuitable for living and life of various fauna.

The impact on terrestrial animals associated with the disturbance of their habitat occurred in the 70s, therefore, by the present moment the animal world of the adjoining territory has adapted to living in an open landscape, resulting in the formation of a certain community of animals and birds, their species composition, abundance, the conditions for their reproduction, migration routes.

The habitats of rare animals listed in the Red Book in the area of the object are absent.

The physical environment

In the area of the object natural and man-made sources of radiation contamination is absent. In addition, the reconstruction of the former workshop does not involve the installation of equipment that can be a source of radiation.

Changes in physical impact from the operation of the facility, in relation to the existing situation, are not expected.

Socio-cultural environment

The production of curb stone, paving tiles and hollow bricks for the last few years has reached enormous volumes, and is one of the most profitable and popular areas in small business. Such products have a standard shape and simply size, so they will not cause great difficulties. Besides, this type of pavement tile is very beautiful, practical, and most importantly, very resistant to mechanical loads and climatic factors.

Positive factors of this project:

- Increase of workplaces;
- Production of building materials different from the materials available on the market, i.e. the increase of the building market;
- Recycling of production wastes;
- Implementation of innovative methods of receiving concrete;
- Implementation of political and economic agreements between the Russian Federation and the Republic of Kazakhstan;
- Improvement of trade relations within the customs Union;
- Affordable cost of this equipment;
- The decline in the prices of construction materials by involving them in waste production, i.e. reducing the cost of production;

As for the negative factor is:

- Slight dusting in the working area of the shop.

Thus, the re-equipment of the former workshop for the production of curbstone, paving slabs and hollow bricks will not lead to a deterioration in social conditions and public health.

Taking into account the aforesaid, it can be concluded that this conversion is socially significant and will have a positive impact on the economic condition of the Republic of Kazakhstan.

3. DETERMINATION OF POTENTIAL IMPACT

Brief characteristics of air pollution sources

During work the sources of air pollution will be:

- **Painting work – enamel consumption -0.085 t. Mark LKM – PE-251 Atmospheric Pollution Index (API) No. 6001;**

- **Welding – electrodes consumption brand MP – 4 will be 15 kg/period API No. 6002;**

- **Internal combustion engine – trucks diesel 5-8 t in the quantity of 1 PC API No. 6003.**

During the period of operation the sources of air pollution will be:

- **Suction of bulk materials API No. 6001.**

- **Internal combustion engine – trucks diesel 5-8 t in the quantity of 2 PCs API No. 6002.**

List of pollutants emitted into the atmosphere for the period of work

Table 2

Code of pollutant	Name of substance	MPC max. single, mg/m3	MPC average-daily, mg/m3	Estimated safe emission level mg/m3	Hazard Class	Emission of a substance g/s	Emission of a substance t/period
1	2	3	4	5	6	7	8
0123	Iron oxide /in terms of iron/		0.04		3	0.00275	0.0001485
0143	Manganese and its compounds /in terms of manganese (IV) oxide/	0.01	0.001		2	0.0003056	0.0000165
0304	Nitrogen (II) oxide (Nitrogen oxide)	0.4	0.06		3	0.0000625	0.000001
0328	Carbon (Soot)	0.15	0.05		3	0.0000419	0.0000007
0337	Carbon Oxide	5	3		4	0.000868	0.0000141
0616	Xylene (a mixture of isomers of o-, m-, p-)	0.2			3	0.000347	0.001062
0620	Ethylbenzene (Styrene)	0.04	0.002		2	0.000972	0.002975
0621	Methylbenzene (Toluene)	0.6			3	0.000347	0.001062
1408	4-Methylpentan-2-one (Methyl isobutyl ketone)	0.1			4	0.00264	0.00807
1411	Cyclohexanone	0.04			3	0.00264	0.00807
2732	Kerosene			1.2		0.000146	0.0000024
0301	Nitrogen (IV) oxide (Nitrogen dioxide)	0.2	0.04		2	0.000385	0.0000062
0330	Sulfur dioxide (Anhydride sulfurous)	0.5	0.05		3	0.0000694	0.0000011
0342	Fluoride gaseous compounds (hydrofluoride, silicon tetrafluoride) (Fluoride compounds gaseous (hydrogen fluoride, silicon tetrafluoride)) /in terms of fluorine /	0.02	0.005		2	0.0001111	0.000006
	TOTAL:					0.0116855	0.0214355

The list of pollutants emitted into the atmosphere during exploitation

Table 3

Код загр. веще- ства	Code of pollutant	Name of substance	MPC max. single, mg/m3	MPC average- daily, mg/m3	Estimat ed safe emissio n level mg/m3	Hazard Class	Emission of a substance
1	2	3	4	5	6	7	8
0304	Nitrogen (II) oxide (Nitrogen oxide)	0.4	0.06		3	0.000125	0.0000068
0328	Carbon (Soot)	0.15	0.05		3	0.0000928	0.0000043
2732	Kerosene			1.2		0.00032	0.0000156
0301	Nitrogen (IV) oxide (Nitrogen dioxide)	0.2	0.04		2	0.000769	0.0000416
0330	Sulfur dioxide (Anhydride sulfurous)	0.5	0.05		3	0.000153	0.0000073
0337	Carbon Oxide	5	3		4	0.001896	0.0000927
2908	Dust inorganic: 70–20 % silica (chamotte, cement, cement dust - clay, shale, blast Slag, sand, clinker, ash silica, etc.)	0.3	0.1		3	0.00007705	0.0016329 6
	TOTAL					0.00343285	0.0018012 6

Water consumption during work

For the period of work, the source of water supply will be imported water. Consumption of drinking water, based on the requirements of SNiP RK 4.01.41-2006, was calculated under a one-shift operation regime of 8 liters per shift. Thus, for the period of work, with 4 workers, which will take 90 days (three months), water consumption will be:

$$\text{Calculation: } (4 \times 8 \times 90) \div 1000 = 2.88 \text{ m}^3$$

Water consumption for the period of operation

For the period of operation, the source of drinking water supply will be imported water. Consumption of drinking water, based on the requirements of SNiP RK 4.01.41-2006, was calculated under a one-shift operation regime of 8 liters per shift. Thus, for the period of operation, with 6 employees and 300 working days per year, water consumption will be:

$$\text{Calculation: } (6 \times 8 \times 300) \div 1000 = 14.4 \text{ m}^3 / \text{year}$$

For technical needs will be involved 2178 m³ of water per year.

These calculations of water consumption are theoretical, practical consumption is many times less.

Water disposal

For the period of the work, the generated household sewage will flow into the outhouse toilet.

For the period of operation, household sewage will be diverted to the cesspool.

The balance scheme of water consumption and wastewater disposal is presented in Table 4.

The balance scheme of water consumption and water disposal

Table 4

Production	Water consumption, m ³ / period						Water consumption, m ³ / period					
	Total			Recycled water	For technical needs	For domestic and household needs	Total	The volume of reused wastewater	Production wastewater	Household waste water	Irreversible consumption	Note
		Total	Including drinking quality									
For the period of work												
Workshop	2,88	2,88	2,88			2,88	2,88	-	-	2,88		-
For the period of exploitation												
Workshop	2192,4	14,4	14,4		2178	14,4	14,4	-	-	14,4	2178	-

Protection of groundwater and surface water

In this project, waste production, raw materials are stored in closed metal bins. To prevent pollution of surface and groundwater the storage and regular removal of household waste is provided.

Brief description of the sources of waste

The calculations are performed according to Appendix No. 16 to the decree of the Minister of environment protection of Kazakhstan of April 18, 2008.

Waste generated during the work:

- solid household waste;
- Construction waste.

Solid household waste. Physical state - solid. Do not dissolve in water.

Waste collection will be made in the container at the facility site, followed by removal to landfill under the contract.

The calculation of the amount of waste from workers:

If the average norm of solid waste per workstation - 0.3 m³/year, and with weight of 0.25, in a single shift mode, taking into account 4 employees, is formed:

$$\text{Calculation: } 4 \times 0.3 \times 0.25 = 0.3 \text{ ton/year}$$

Construction waste

Construction waste will be generated during construction works. The number of construction waste is defined by the design data and corresponding to 5 tons.

Waste collection will be made in the container at the facility site, followed by removal to the city landfill under the contract.

By aggregate state is solid, by physical state is not soluble in water, not flammable, non-explosive, by chemical does not possess reactivity, does not contain extremely hazardous, highly hazardous and moderately hazardous substances. Basically it is composed of the following pollutants - oxides of silicon, aluminum, iron, calcium. Construction waste refers to the green list of wastes – G (GG170 – construction waste – waste mixture of concrete, broken bricks, plaster).

Waste generated during operation:

Solid Household Waste

Solid household waste. Physical state - solid. Do not dissolve in water. Waste collection will be made in the container at the facility site, followed by removal to landfill under the contract.

The calculation of the amount of waste from workers:

If the average norm of solid waste per workstation - 0.3 m³/year, and with weight of 0.25, in a single shift mode, taking into account 6 employees, is formed:

$$\text{Calculation: } 6 \times 0.3 \times 0.25 \times 1 = 0.45 \text{ ton/year}$$

Standards for waste disposal of production and consumption are shown in table 5

Standards for waste of production and consumption disposal

Table 5

Name of waste	Formation of substance , tg/year	Accommodation , tg/year	Transfer to third parties , tg/year
1	2	3	4
For the period of work			
Total:	5,3	-	5,3
Including waste production	5,5	-	5,5
Consumption wastes	0,3	-	0,3
Green level of danger			
Municipal solid waste (MSW)	0,3	-	0,3
Construction waste	5		5
For the period of operation			
Municipal solid waste (MSW)	0,45	-	0,45

PLAN ON MITIGATION OF CONSEQUENCES AND MONITORING

Mitigation plan of consequence

Stage of work				
Event	The expected impact on the environment	The proposed mitigation measure for the environment and working staff	Responsible for the implementation of mitigation measures	The period of implementation of mitigation measures
1	2	3	4	5
Construction installation wor	Formation of dust and welding aerosol, construction waste	<ul style="list-style-type: none"> - Collection and removal of construction waste will be carried out by specialized licensed enterprises - Initial briefing conduction at the workplace and briefing on fire safety issues before starting work. 	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works
	Temporary atmospheric air pollution	<ul style="list-style-type: none"> - Minimizing emissions through optimal management of work and control. Application of measures to minimize the level of "dust" (spraying with water and airing the room); - Provision of construction workers with respirators. 	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works
	Waste generation	<ul style="list-style-type: none"> - Garbage containers will be installed in the construction sites. Construction garbage will be exported only to specially designated platforms under the contract. - Provide for separate collection of secondary material resources. 	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works
	Accidental prevention and occupational safety	<ul style="list-style-type: none"> - Appointment of the responsible person for occupational safety and accident prevention by head of the subproject - Initial briefing conduction at the 	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works

		<p>workplace and briefing on fire safety issues before starting work.</p> <ul style="list-style-type: none"> - The use of personal protective equipment: overalls, safety glasses, hard hats, respirators and gloves designed for construction work. - Should be involved contractors, possessing the necessary qualifications and opportunities to eliminate factors, which are dangerous for their employees in the field occupational safety and health. - At hiring contractors and third parties will be indicated the requirement of environmental protection, occupational safety and accidental prevention. 		
	Instruction for issues of occupational safety and accidental prevention	- The director of «EcoStroy NII-PV» is obliged to organize the training and instructing of the company's employees and contractors about dangerous factors and measures to protect them from harmful influences LLP	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works
	Impacts on water resources	- Prevention of groundwater contamination by domestic sewage (timely cleaning of the cesspool)	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works
Electric and fire safety	Identify potential risks	- During the repair and maintenance all devices and equipment must be switched off (de-energized and left open, with controlled locking mechanism) and are equipped with	Engineer-technologist LLP «EcoStroy NII-PV» and master builder	Construction and installation works

	<p>an appropriate sign (warning sign on the locking mechanism).</p> <ul style="list-style-type: none"> - In conditions of high humidity or with the possibility of high humidity, all electrical equipment must be double insulated and double grounded; it is necessary to use electrical equipment with earth-fault protection. - Conducting a briefing on the electrical safety of installations operating under voltage up to 1000 V. - Installation of fire extinguishing means (fire extinguisher powder type OP-5) 		
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Stage of project work			
System of mixture preparation			
Event	Description of the mechanism operation	The proposed mitigation measure for the environment and working staff	Responsible for the implementation of mitigation measures
1	2	3	4
Handling of bulk and raw materials (during storage, pouring and feeding)	<p>Necessary materials: cement, sand, water, aggregate, additives.</p> <p>Intensive unorganized sources of transformation are material overspillings, loading of material into open wagons, half-wagons, loading of material – by grab into the bunker, unloading of tippers in a bunker, material of the open cesspool reference in the warehouse, etc.</p>	<ul style="list-style-type: none"> - Bulk materials will be stored in special bunkers; - The process of shredding will be carried out in a mechanized way, which excludes the negative impact on personnel. The ventilation system also will be checked. - All materials will be requested for quality certification. 	Operator LLP «EcoStroy NII-PV»
Preparing, moistening and loading of the mixture	<p>The mixture preparation system includes: a dispenser, a mixer, a conveyor, a control panel. The dispenser is made in the form of a welded tank, divided by a partition into a</p>	<ul style="list-style-type: none"> - During sagging tape by moving the drum which is driven with screws with weakened locknuts produce its tension. Adjust the symmetrical position of the tape relative to the frame 	Operator LLP «EcoStroy NII-PV»

	<p>compartment of a filler and a compartment of an astringent material. The level of stuffed components in the compartments is controlled visually. The dosage of water is carried out by means of a tank in which a movable float valve is installed, it is fixed by a collar and cuts off a set dose of water, which is fed through a ball valve from the water mains. Drain the water into the mixer produced by the ball valve, during this valve must be closed. The mobile float valve is connected to the ball valve via a flexible hose.</p>	<p>by the skew of the driven drum. After the end of the shift, remove the remnants of the concrete mixture from the outer and inner surfaces of the tape and shoulder blades.</p> <ul style="list-style-type: none"> - Monthly check the tension of the belt. - In time clean the surfaces of the drums from the adhering mixture. 	
Control of the conveyor electric motors	<p>It is carried out from the control panel with the help of start-protection equipment, which is placed in the power cabinet</p>	<ul style="list-style-type: none"> - In time clean the surfaces of the drums from the adhering mixture. - Monthly monitoring of the condition terminals of electric motors. Based on the results of the control the audit result log will be filled. 	Operator LLP «EcoStroy NII-PV»
Work on vibropress	<p>Mixture loading module fixed on it and docked the module for the supply of pallets.</p> <ul style="list-style-type: none"> - Matrix in the uppermost position, punch in the highest position, on the table is an empty pallet. - During applied to the handle of the joystick «Matrix down» the matrix is lowered onto the pallet and presses it against the table. - After loading the mixture into the matrix (is accompanied by the inclusion of a vibrating table for a certain time) the punch goes down and the final molding of the products in the matrix takes place under combined effect of vibration and pressure punch. - The matrix rises without lifting the punch from the 	<ul style="list-style-type: none"> - Use individual noise protection (headphones antiphons) at the administrative control over their application. - Daily cleaning of the forming tooling and other components from the remnants of the mixture. - Do not allow the mixture to spill onto the bed and on the vibrating table. - Daily check the tightness of all screw connections. - Particular attention is paid to fixing the matrix brackets to the guides, vibration table to bed, punch plate to core sleeves, as well as the points of attachment of the forming tooling. - to check the condition of the vibration table pillows at least 3 times a year. - Cushions should be 	Operator LLP «EcoStroy NII-PV»

	<p>fresh molded products. Decking of the products takes place directly on the pallet. further movement of the matrix up to the initial state occurs together with the punch during releasing the products from the matrix.</p> <p>- There is a repetition of the work cycle after changing the pallet with the products to the empty one.</p>	<p>replaced in case of failure.</p> <p>- Equipment that has open moving elements or a jamming zone, which may pose a hazard to all workers, must have protective devices or a casing over the moving element or the jamming zone.</p>	
Pallet feed module	<p>Provides the replacement of pallets in the position of molding vibropress. The pallets installed on the shelves do not require further rearrangements.</p>	<p>- Daily visual inspection of the module's units, do not allow the seizing of pawls and mobile abutments</p> <p>- If necessary, disassemble the connections and restore mobility.</p> <p>- Lubrication of the module is not required.</p>	Operator LLP «EcoStroy NII-PV»
Forming block			
Remote Control	<p>In the case of the control panel, an electrical cabinet is built in, which includes a power starting equipment the pedal built into the console is designed to turn on the vibrating table motor. The pedal returns to the original after-load position. To control the process, a control panel is located on the upper part of the body. The working bodies of the forming block are controlled by a manually operated hydraulic distributor. The connection of the console with the forming unit is carried out by cables with quick-detachable connectors. To ground the control panel there is a lug located on the back wall. High pressure hoses are laid between the hydraulic distributor and the bracket.</p>	<p>- Remove dust from the electrical equipment placed in the console at least 1 time in 2 months. At least once every 4 months, check the tightness of the contact connections on the remote control equipment and terminal blocks.</p> <p>- Pay special attention to the contacts of power circuits and grounding circuits.</p> <p>- Operation and storage of the control panel is only permitted when the door is firmly closed to ensure the tightness of the internal volume of the console.</p>	Operator LLP «EcoStroy NII-PV»»
Work on lifting equipment	<p>Replacement of the shelter with pallets with freshly formed products on a rack with empty pallets.</p>	<p>- After changing the forming tool, the height sensor must be set.</p>	Operator LLP «EcoStroy NII-PV»
Moving pallets with	<p>- It is carried out with the</p>	<p>- Maintenance of the</p>	Operator LLP

products	<p>help of the module of pallets submission.</p> <ul style="list-style-type: none"> - A rack with six empty pallets is installed on the feeder frame catcher using a lifting device. During the trolley moves from the vibropress, the pallets with the finished product are moved to the rack by one position, wherein extreme empty pallet from the rack rolls down the frame guides to the lower level. When returning the trolley to the vibratory press The pallets with the help of a connecting rod from the lower level on inclined runners fall on the table of vibropress. The drive of the trolley is carried out by a hydraulic cylinder. After the rack is filled with pallets with products, using a lifting device, it is removed and a rack with empty pallets is installed in its place. At the end of the cycle, the products are removed from the pallets, which remain in their places on the rack. 	<p>loading module consists in the daily thorough cleaning of the bunker, the shutter, loading box with activator from the remnants of the mixture.</p> <ul style="list-style-type: none"> - Do not allow the build-up of residues of the mixture on the underneath the bunker sheet in the area where the feedback sensors are located. 	«EcoStroy NII-PV»
Work on hydraulic equipment	<ul style="list-style-type: none"> - It consists of a pumping unit, a hydropanel with directional hydraulic equipment, a hydraulic cylinder of the mixture loading module, a hydraulic cylinder of the pallet feed module, a punch hydraulic cylinder, two matrix cylinders and a control panel on which a manual distributor is mounted. All elements are connected to each other in a single hydraulic system by steel pipelines and high-pressure hoses. - The oil volume in the hydraulic system is approximately 200 liters. Not allowed to mix different types of hydraulic oils. 	<ul style="list-style-type: none"> - Daily maintenance of the hydraulic system is reduced to checking the oil level in the pumping unit and visual inspection of all elements. - If necessary, tighten the threaded connections and fasteners of hydraulic equipment. - Ensure filtration of the filled working fluid before pouring oil into the tank. - A complete oil change is recommended at least once a year. 	Operator LLP «EcoStroy NII-PV»

Waste management		<ul style="list-style-type: none"> - For the period of work all generated waste will be temporarily stored in metal containers. As they accumulate, they will be exported by the contractor, then contamination of the soil surface will not occur. - There will be a clear organization of collection, storage and disposal of waste to their locations. Also, regular cleaning of the territory is planned, both during the works and during the exploitation. - For the period of carrying out works refueling of vehicles on the territory of the site is not expected. 	Engineer-technologist LLP «EcoStroy NII-PV»
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Monitoring plan

Stage of work				
Monitoring parameter	Place of monitoring	Method for monitoring	Period of monitoring	Responsible for the monitoring
1	2	3	4	5
Construction garbage	Workshop	<ul style="list-style-type: none"> - Collection and removal of garbage will be carried out by specialized licensed enterprises with frequency as they accumulate. On the result will be drawn up an act of receiving waste transfer. - It is obligatory to keep a journal and to submit an annual report to the authorized body in the field of environmental protection. 	Constant control	Engineer-technologist LLP «EcoStroy NII-PV»
Effluent discharges	Workshop	<ul style="list-style-type: none"> - To prevent possible hydro-geological changes in the area of the company's location, a working program will be developed to monitor groundwater in the territory of the enterprise. - For the purpose of rational consumption of water resources at the entry of the water main water meters will be installed in the building. 	Effluent discharges	Workshop
Accidental prevention and occupational safety during work conducting (equipment). Use of personal protective equipment.	At work places	<ul style="list-style-type: none"> - Visually by checking the practical use of equipment and checking compliance with the regulations of existing equipment. - Use of personal protective equipment: glasses, hard hat, overalls, respirators to 	Constant control	Engineer-technologist LLP «EcoStroy NII-PV»

		<p>work with dusty materials.</p> <ul style="list-style-type: none"> - Conducting a journal on the conduct of briefings on accidental prevention and occupational safety; - Notes about the training will be checked and, if necessary, improvements will be made. - Technical condition, safe operation, inspection, control of compliance with schedules of periodic inspection and repair of cranes. 		
Stage of project work				
Risk of fires and explosions	Workshop, warehouses	<ul style="list-style-type: none"> - Checking fire fighting systems. The conductive surfaces must be grounded to prevent the discharge of static electricity. - Notes of the training conducted will be checked and improvements will be carried out if necessary. - The emergency response plan will be periodically reviewed and updated. 	Weekly	Engineer-technologist LLP «EcoStroy NII-PV»
Health and safety of workers	Workshop, warehouses	<ul style="list-style-type: none"> - Use of personal protective equipment. (glasses, hard hat, overalls, respirators to work with dusty materials) - Annual medical examination of workers. Maintaining the relevant notes. - Conducting a journal on the conduct of briefings on accidental prevention and occupational safety; - Notes about the 	Daily	Engineer-technologist LLP «EcoStroy NII-PV»

		<p>training will be checked and, if necessary, improvements will be made.</p> <ul style="list-style-type: none"> - Certification of production facilities for working conditions. 		
<p>Accidental prevention and occupational safety during equipment exploitation (methods of monitoring)</p>	<p>Workshop</p>	<ul style="list-style-type: none"> - Training of the personnel equipment operation. Admission to the equipment only after testing the knowledge and skills. Notes on the results of testing the knowledge of the operation of equipment will be maintained, verified and, if necessary, improvements will be made - Technical condition, safe operation, inspection, control of compliance with schedules of periodic inspection and repair of cranes. - Availability of certificates of conformity for used raw materials and equipment. 	<p>At least once a year</p>	<p>Engineer-technologist LLP «EcoStroy NII-PV»</p>
<p>Waste management</p>	<p>Territory of the enterprise</p>	<ul style="list-style-type: none"> - The collection of waste will be carried out in a container at the site of the enterprise, with the subsequent exportation to a municipal landfill site under a contract. - There will be a clear organization of collection, storage and disposal of waste to their location by recording waste and compiling periodic reports in accordance with the environmental 	<p>Constant control</p>	<p>Engineer-technologist LLP «EcoStroy NII-PV»</p>

		code of the Republic of Kazakhstan.		
Emissions to the atmosphere	Workshop	- The control will be carried out by calculation method proceeding from quantity of used raw materials, for observance of a level of MPE (it will be established upon receipt of an emission permit). - Quarterly submission of reports to specialized bodies is envisaged.	Quarterly control	Engineer-technologist LLP «EcoStroy NII-PV»»

PUBLIC CONSULTATIONS

The environmental plan is presented for public access in English and Russian at the following link <http://psu.kz/index.php?lang=rus>

September 21, 2017 a public hearing was held during which interested parties, as well as local residents in the vicinity of the districts, got acquainted with the plan of measures for environmental protection, asked questions, made comments and wishes. The record of public hearings is attached.