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**ACTION PLAN FOR INTEGRATED
ENVIRONMENTAL MANAGEMENT FOR
RUDA ŚLĄSKA FUA**

**Version 1
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1. BACKGROUND

1.1. Regional context

Functional urban area of Ruda Śląska is composed of three cities-Chorzów, Ruda Śląska and Świętochłowice. It is located inside the Silesian Metropolitan Area which includes 14 cities.

The regional context is mainly metropolitan context as basing on the order of the Ministries Council from 9 March 2017 the Śląsko-Zagłębiowska Metropolis has been established. The area covering 2 553 km², is a dynamic economic centre but also a centre of concentration of medical services as well as academic, cultural and sports services. The Metropolis is the largest urban centre in Poland. Regarding natural resources it is a unique area due to the presence of terrains covered with natural succession. The second exceptional feature is the occurrence of numerous water reservoirs of anthropogenic origin. It is the effect of an intensive, longterm and specific economic activity connected with mining exploitation.

The analysed three cities have raised and developed basing of heavy industry, mainly coal mining and ferrous as well as non-ferrous metallurgy. The spatial structure of these cities constitutes a mosaic of functions and areas of various predestination. It has been defined mainly by the development and many-years functioning of industrial plants located within their borders. In the neighbourhood of the urban centres the industrial and post-industrial objects and areas are located such as spoil heaps and dumping sites. Post-industrial areas present a characteristic environmental resource which is also valuable due to vegetation succession. The stake of anthropogenic areas reaches 55,71% of the whole surface area of the FUA, which means a high level of its transformation.

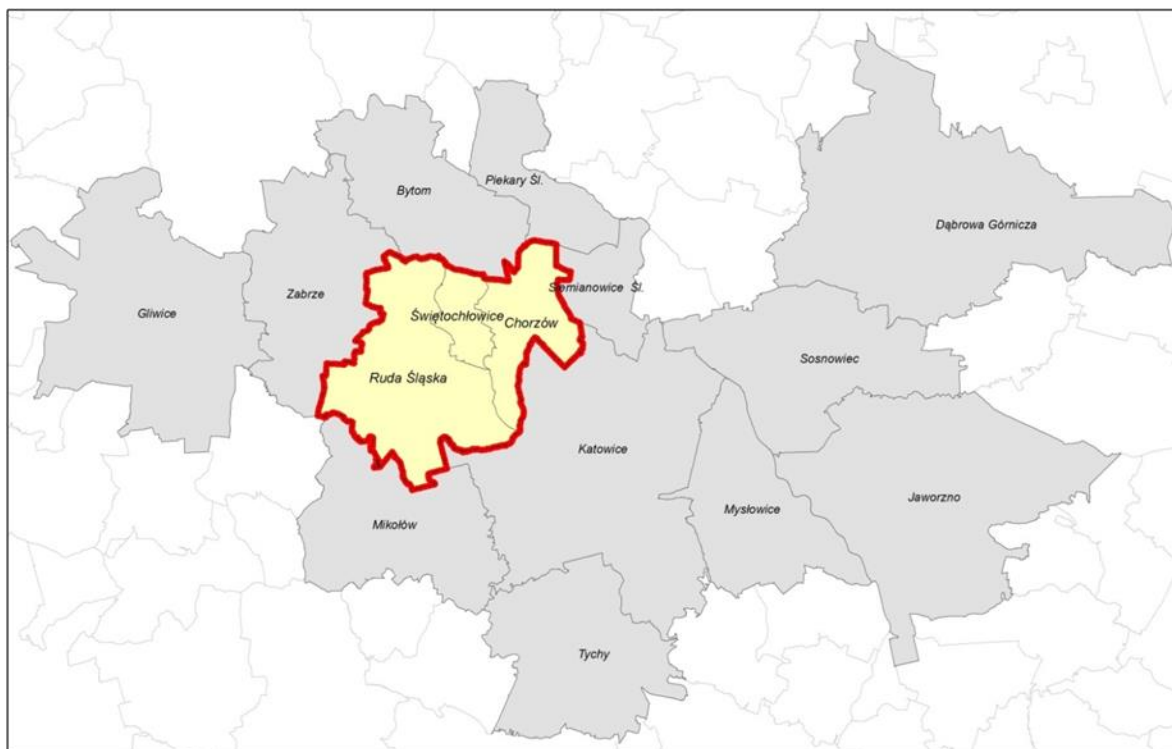


Fig. 1. Location of the three cities: Chorzów, Ruda Śląska and Świętochłowice in Silesian Agglomeration. [Source:IETU, ZPROF 2015]

1.2. ACTION PLAN IMPLEMENTATION vs DEVELOPMENT STRATEGY OF THE FUA

There are several documents concerning the FUA which define its character, features and conditions both economic, environmental and social as well as the document presenting the framework of its development. It is the Integrated Development Strategy of the FUA of Chorzów, Ruda Śląska and Świętochłowice until 2030. In this document the green infrastructure issues are included in the chapters concerning ecology, natural resources and green areas.

Natural resources constitute an important element connecting three cities as well as it is a potential, which can and should be used as a development factor which contributes to raising the quality of life and touristic attractiveness of the area. It is recommended in the Strategy to create a common policy concerning ecology and environmental quality.

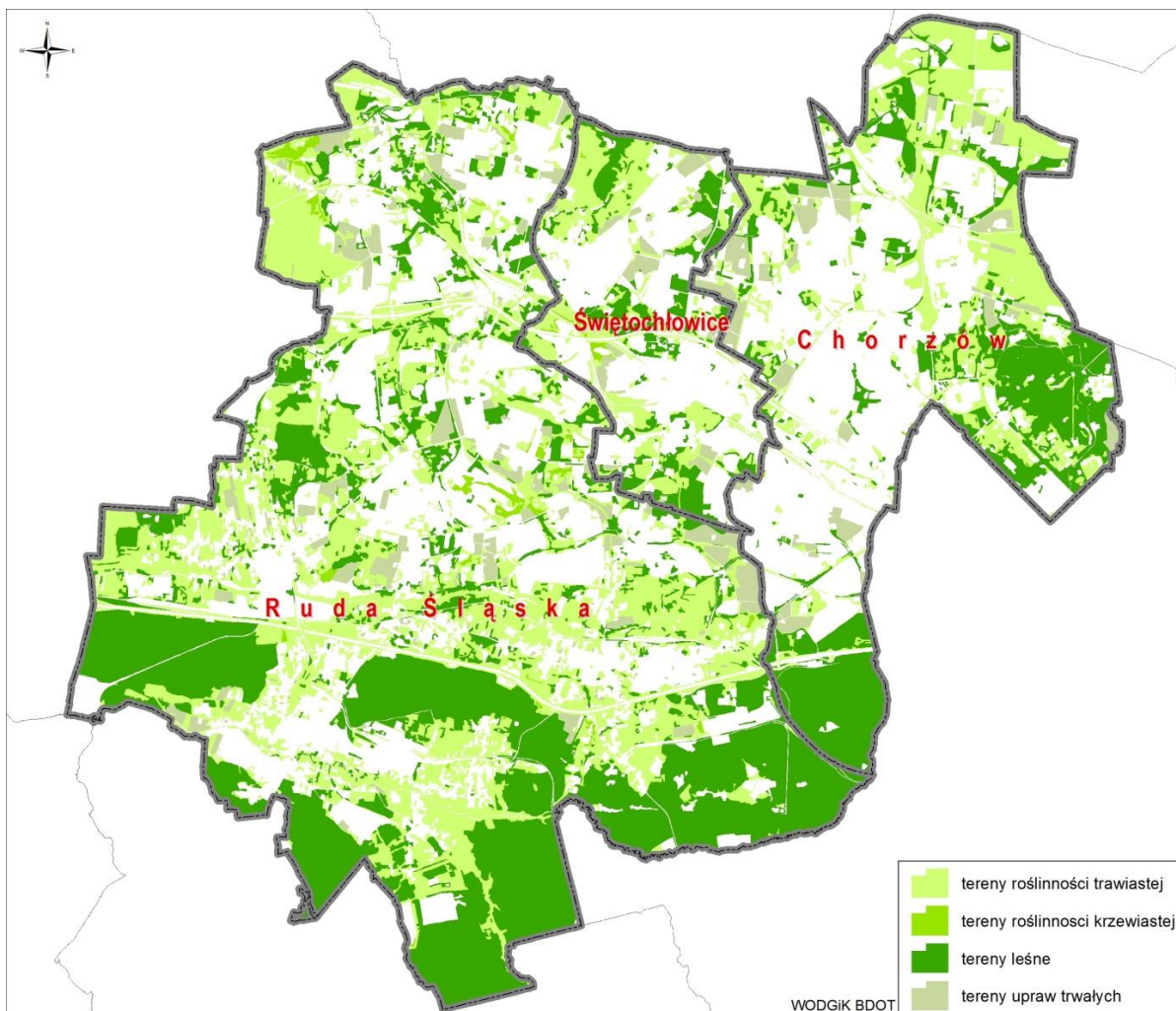


Fig. 2. Green areas in the FUA of: Chorzów, Ruda Śląska and Świętochłowice. [Source: IETU, 2017]



2. ACTION PLAN FUA RUDA ŚLĄSKA

2.1. VISION/MISSION

Vision

Functional Urban Area will be in 2030 an area enriched with a harmonized green infrastructure system serving to protection of natural capital and raising the quality of life of the inhabitants.

Mission

The Action Plan mission in the aspect of nature is strengthening connections of natural system of the FUA cities as an essential component of the Metropolis creating blue and green infrastructure. The efficient natural system with active ecological corridors connecting natural valuable areas will provide strengthening of self-regulation processes, resistance to climate change and stability of ecosystem services.

In the social aspect the Action Plan is aiming at propagation of the idea of healthy life style by creation of biking and walking routes in areas of a high natural potential increasing at the same time an access to ecosystem services connected with bioclimate beneficial for people and necessary for a proper functioning of human organism. The proposed solutions are also to prevent social exclusion of disabled people and these of low income. Ecological education is an integral part of the action plan popularizing knowledge on values of native nature - animals and plants - on processes connected with re-naturalisation of post-industrial areas stimulating also care for an environment by its proper maintenance of purity and aesthetics.

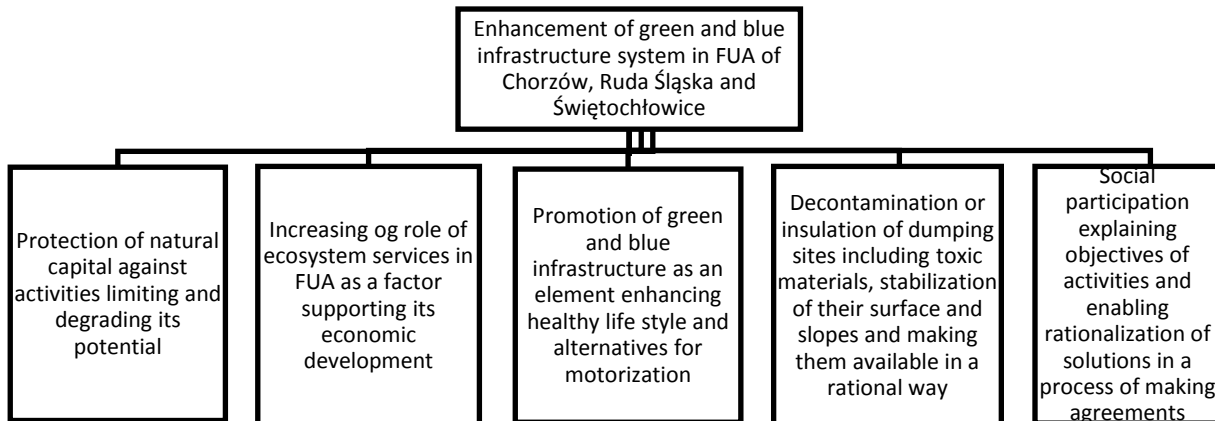
In the economic aspect the proposed system of communication connections based on biking traffic inside cities and between them as well as their recreation attractiveness should affect reduction of the car traffic and costs connected with it. The attractive sites should also attract investments in form of line parks, gastronomy objects etc.

In the spatial aspect it is essential to build safe system of biking routes beyond car traffic roads. They will connect the cities of the FUA and different districts. Many of the proposed routes will be constructed basing on the abandoned railway tracks. The efficient system of biking routes favours a spatial order, but also it is important to integrate it with a comprehensive mapping out recreation and housing areas.

The Action Plan objective:

Enhancement of green and blue infrastructure system in the FUA of Chorzów, Ruda Śląska and Świętochłowice

The system of the Action Plan sub-objectives is presented below.



2.2. ACTIVITIES FOR ENHANCEMENT AND DEVELOPMENT OF GREEN AND BLUE INFRASTRUCTURE

The activities connected with enhancement and development of green infrastructure can be presented in three groups defining their character. These are:

1. Technical activities
2. Organization and legal activities
3. Information and education activities

Ad 1. Technical activities include all kinds of investments presented in the Action Plan as well as complementary activities being implemented in the framework of other programs or projects (e.g. Rudzki Route Program in Ruda Śląska) or projects based on other contracts or initiatives (Adaptation Plans to Climate Change being elaborated for Chorzów and Ruda Śląska).

Within the catalogue of technical activities the following can be proposed as an example:

- Construction of walking and biking routes through valuable natural areas as well as functional connections between existing routes and tracks,
- Reconstruction of tree stand, new planting,
- Re-arrangement of the space and introduction of small architecture elements - benches, information boards etc.
- Construction of education routes,
- Construction or cleaning of existing small retention reservoirs,
- Arrangement for recreation of areas surrounding water reservoirs - urban beaches, marinas,
- Construction of sports grounds and play grounds,

Arrangement of parts of the areas for active recreation and summer and winter sports (extreme biking routes, sledge hillocks, jogging routes).

Ad2. Legal and organization activities include changes of land use planning documents by introducing records on green and blue infrastructure. There can also be study concepts concerning spatial solutions as well as documents proposing administration and legal solutions aiming at



systemic management of these areas. These activities can be addressed to one city or can constitute common initiatives e.g. monitoring system of the whole area. They can be also projects concerning changing of legal records e.g. concerning public procurement procedures (introducing for instance necessity of ecosystem services assessment and/or green infrastructure issues in the records of terms of reference for land use plans). This group of activities includes also proposal of creating common structures responsible for development of green infrastructure (e.g. biodiversity supervision) and proper use of ecosystem services.

Ad3. Information and education activities constitute a wide spectrum of ideas and initiatives directed towards informing the local society on natural values and possibilities of using the recreation potential of these areas. Apart from information on cities web sites and in local press also the information should be addressed directly to the users of the green infrastructure. In the framework of these activities the information system should be built available in the form of application for mobile devices. The range of information can concern an access to the areas and can inform on events that are organized in concrete places of the system. These can be also competitions for children and youth and education campaigns addressed to various beneficiaries of these solutions as well as wide campaigns promoting the green infrastructure as an essential element raising the quality of life in cities of the FUA.

2.3. ECOSYSTEM SERVICES AND HAZARDS FOR URBAN AREAS IN THE CONTEXT OF FUNCTIONAL URBAN AREA

The ecosystem services approach is applied to assure functionality of the cities regarding a stream of benefits connected with services and values offered by nature, realized in a strong link between economy and society.

Ecosystem services as benefits offered by nature to humans, are a basis for wellbeing, economic development and employment (Millennium Ecosystem Assessment, 2005), particularly in areas of high level of urbanization as it is in the case of the Functional Urban Area of Chorzów, Ruda Śląska and Świętochłowice.

Application of ecosystem services approach in urban areas management as one of the elements necessary for functioning of urban areas enables making responsible decisions in the planning and infrastructure development on these areas.

Preservation of ecosystem services as well as their supporting and restoring will allow to create and use „natural capital” and to strengthen environmental potential of functional areas of the FUA cities.

Ecosystem services classification, which is indicating the connection between ecosystem services and quality of human life includes four categories (after: MEA 2005, Kronenberg 2011):

Regulation services	Supply services	Culture services	Supporting services
Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of	Supply services - water supply - Water circulation cycle;	culture resources, aesthetic functions,	circulation of elements, primary production, habitat function,



pollution and self-purification (incl. water self-purification), Regulation of soil processes Soil formation Reshaping of abiotic environment. Improving soil quality Regulation of pollution and self-purification - absorbing of dust pollution	Other biological resources Genetic resources - biodiversity	recreation, science and education.	hydrological cycle
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In the Action Plan 25 areas in three cities have been selected. In Ruda Śląska - 8 areas, in Chorzów 6 areas + 7 areas in Silesian Park located within Chorzów territory and 4 areas in Świętochłowice.

In 10 areas regulation services are prevailing as present ecosystem services. In 11 areas culture services are indicated as present ecosystem services. In almost all areas these services are dominating (10). In 21 cases supply services are pointed especially water supply services.

Potential ecosystem services include mostly culture services, supporting services and supply services. Regulating services are indicated inly in one case.

2.4. IMPLEMENTATION OF ACTION PLAN - MANAGEMENT STRUCTURE

Action plan for green infrastructure strengthening and development in Functional Urban Area of Chorzów, Ruda Śląska and Świętochłowice is concerning the area including three cities therefore it requires defining rules for management and implementation of this plan as well as projects and undertakings resulting from it. These rules should provide for the form of co-operation of three independent self-government urban units with using tools supporting public participation.

The overall objective of the action plan - following its title - is strengthening and development of green infrastructure in the FUA. As this objective is coherent with the records in strategic documents concerning development of the three cities, the authorities should undertake the task of the common work aiming at reaching this objective. It is also reasoned from the view point of various sources of funding, which often prefer projects which are submitted by a group of cities acting in the framework of an agreement. Such projects are supported preferably, which are to bring benefits to higher number of inhabitants and to bigger area than individual city.

The Functional Urban Area including three cities: Chorzów, Ruda Śląska and Świętochłowice is an integrated area, identified as a result of delimitation of areas characterized with common problems as well as areas with features deciding on its strength and development potential. Identification of development factors and barriers in this area allowed to define optimal final range of the functional area from the view point of transport and settlement efficiency, life quality and access to public services. Therefore the range of the functional area has been defined basing on real connections but not formal ones.

In the case of the action plan of strengthening and development of green infrastructure for these three cities, the management of this plan should be carried out with participation of these cities basing on a defined form of co-operation.



It should be stressed that a strong structure bonding the cities towards implementation of the action plan imposes stronger obligation to the cities to realization of tasks inscribed in the plan. Establishing a structure for action plan implementation is a consequence of the acceptance of the LUMAT project initiative expressed earlier as well as will of co-operation at elaboration of the action plan concept. Following these declarations the city of Chorzów has establish the team for realization of these tasks and the city of Świętochłowice has accepted the idea in a special letter issued by the Mayor. The city of Ruda Śląska - being the project partner is involved in the work in the framework of its tasks in the project.

It is proposed to establish a structure called **Permanent Conference (Permanent Task Force/Working Group) for Implementation of Green Infrastructure in the Functional Urban Area of Chorzów, Ruda Śląska and Świętochłowice**, which should include the group of teams which have been working on the concept of the Action Plan in the framework of LUMAT. This group will be composed of officials from three cities of the FUA, representing departments of environmental management, land use planning, municipal and development. Participation of these people is coherent with the idea of the LUMAT, whose objective is integration of sustainable environmental management with land use planning and management in functional urban areas. Implementation of the plan concerning strengthening and development of green infrastructure requires co-operation of these departments.

2.5. DECISION PROCEDURES AND THEIR IMPLEMENTATION

Within the LUMAT project a tool has been proposed supporting decision making proces, which gives the opportunity for active involvement of the public in order to achieve their expectations.

InViTO tool is an interactive tool for visualization, which can be used for analysis and discussion concerning a particular area and activities planned on it. It is aiming at making available and presenting technical data in a friendly way for the user. In the framework of the tool implementation training will be provided concerning application of this tool.

The tool is of interactive character which enables access to data and creation of the picture of a particular area. It constitutes a visual language facilitating communication by presenting information which is intuitively understood. Therefore it enables participation of persons who are not specialists. The tool is not presenting solutions but it supports the user in searching a common vision.

The tool can be perceived as an instrument facilitating dialogue, which shows the available information and enables formation of various visions concerning the presented action plan.

3. DESIGN ASSUMPTIONS OF PILOT PROJECT

Main problem and target of actions designed for area of zinc spoil heap in Ruda Śląska is the soil contamination and the process of the situation improving with remediation, to reach safe recreation open space there. Additional targets are: to mitigate dangerous sharp and high crags on the northern heap edge; build possibly low cost in maintaining leisure infrastructure with possibly broad offer, vandalism resistible, and with deep connections with local identity and history.

Remediation of topsoil in the area concerned is provided by phytostabilization on the top of spoil heap and covering northern slopes with clay and new soil layers. That should prevent inhabitants



from the contact with dangerous substances. That is important especially on the top of spoil heap where the most of sport and leisure activities will occur. To protect people against heavy metals present in metallophyte plants there is planned destroying of green cover on the spoil heap top with chemicals and replacing them with proper safe species. Southern slope will remain nearly untouched with minor activities provided. Nearly all designed activities are connected with northern and top area. For southern slope gradual exchange of plant species is planned, and will be realized by cutting grass before seed maturity and sowing target species of grasses, similar as for phytostabilization.

Phytostabilization design involves the reduction of the mobility of heavy metals in soil. That can be accomplished by decreasing wind-blown dust and minimizing of soil erosion according to creation of tight plant cover. Reducing contaminant solubility or bioavailability to the plants depends on pH level and presence of stabilizing substrate. The addition of soil amendments, such as brown coal, and alkalizing agents in form of lime fertilizers, can decrease solubility of metals in soil and minimize leaching to groundwater. Most of active chemical compounds of heavy metals are blocked this way and neutralized. The mobility of contaminants is reduced by the accumulation of contaminants by plant roots, absorption onto roots, or precipitation within the root zone. To provide proper habitat for planned grasses there is designed addition of fertile soil to the top layer of the ground. There were chosen grass species especially suitable to limit contaminations in roots and restrain their migration to aboveground stems. Three species of grasses with diverse form varieties were used. They are *Lolium perenne* - rye grass, *Festuca rubra* - creeping red fescue and *Miscanthus x giganteus* - giant *miscanthus*. According to some scientific research these grasses can grow on zinc spoil heap habitat and have very limited traces of heavy metals in leaves. Phytostabilizing area - 12266m², covering of northern slopes with clay and new soil area - 12366m², southern slope for gradual species exchange - 17778m².

Plant cover appearing on spoil heap represents *xerophilic* or dry preferring plant communities. They are native and common for regional flora. It is inconvenient from the biodiversity protection point of view to destroy such green cover of top of the spoil heap, but it is necessary. Involved species of grasses except *miscanthus* are native too - *Lolium perenne* - rye grass, *Festuca rubra* - creeping red fescue. Trees planted there are mostly native too. Observing present composition of them were chosen *Betula pendula* - silver birch, *Quercus robur* - common oak, *Sorbus aucuparia* - common mountain ash and planted as a Land Art in form of green walls *Carpinus betulus* - common hornbeam. Southern slope enable limited plant succession with gradual rising of rye grass and creeping red fescue share. Some western parts of birch wood are generally left for natural spontaneous vegetation. Only at the base of southern slope are designed ornamental alien species, extremely resistible for dry soil. Some spots are indicated as "nature touch" or "plant signatures" - so called in Australia, with symbolic planting of native plants (abstraction from an actual plant community), they offer some „essence of the place". These spots are left untouched with metallophyte plants and can give an idea of natural colonization of zinc spoil heaps. The area except for playground located to the south of heap and playing field on the top of it will have limited maintaining. That should provide possibility for natural succession. On the edge of northern slope was noticed evidence of *Reynoutria japonica* - Japanese knotweed, invasive plant. During rebuilding of northern slope it should be destroyed, anyway its growth should be controlled in future.

According to that first consultations in 2014 was designed first conception plan. After thorough assessment of local conditions, treats and relations were prepared final conception plan in



February 2017. Its assumptions were presented to local community on the meeting in 23.02.2017. Main direction of paths were kept as well as localization of playground, open space sports facility and playing field. Places for grill were moved to the west, to be far from high voltage line. New elements of functional structure were added - mentioned in description of construction design.

According to landform change northern slope is transformed. Limited part is left untouched as the „essence of the place” - high crag with moss and grass plant cover, with matured birch tree and some outcrop of spoil heap material with slag sinters. Some information points of educational path connected with slag features and metallophyte plants are placed nearby. The slope will be planted with birches, oaks and ash trees in geometrical groups to support expression of manmade landscape, but with use of native trees. On the area northern edge is designed Land Art made of hornbeam trees. On the middle of heap top is designed view point in form of hill about 5 m high. That will be made of spoil heap material and covered by clay, soil and sown by grass. There will be installed lunette, some benches and educational path point. To the north of view point is designed sledge slope. Other top area will be flattened and treat with phytostabilization to neutralize heavy metals contamination. To the west of view point is located playing field. It will be sown densely than other places, and will be well maintained. Around the playing field is designed low dike with tubes-tunnels for children play. Furthermore to the west will be placed grill area under canopy of birches. Places for grill stands will have form of gravel square pits surrounded by timber kerbs. Dark basalt gravel correspond to zinc slag but is not contaminated. Stands for grill will be separated by the dashed lines of miscanthus. That will give sense of intimacy providing kind of green wall maze for children play.

By the center of area will be built main path joining 1 Maja Street with "Trakt Rudzki" path. Near western end, on the place where the path will reach top ground platform are designed concrete hammocks. These constructions will have timber cover suitable to sit on and handles to mount own hammock. Leaving hammock for days in open space could be not reasonable because of possible vandalism and high fall of furnaces dust which makes textile dirty, especially during rainfall.

Quite near to them are designed view concrete boxes with two deck chairs in each. Intimate space, with view outlined by edge of box will have boards of educational path with information about local history, industrial revolution, zinc production technology, features of spoil heap material and metallophyte plants.

To the south of main path will be located three iron factory vats on the slag spot. Vat will be filled with soil and planted *Lycium barbarum* - boxthorn. That shrub has falling down branches, bright silver-green leafs and can symbolize liquid metal in high temperature. Around vats will be small basin with slag gravel and educational board with zinc and iron production technology.

Near vats will be placed next group of hammocks.

On the side path curve is designed second - "small" view point. Following that path one can find open space gym. There is either the place for boulder of zinc ore with educational board. Some additional hammocks stand there on the slope edge.

On the east border is jumping track for BMX bicycles located in dean made of coal mine rock. Slopes of dean will be covered by clay and grass. Track path will be covered by clay and lime gravel. The same surface is designed for BMX circus in eastern border of area. Circus has form of round dike with ramps about 2m high, with walls suited to bike extreme rides and jumps.



On south border is designed another path going to playground. Most of path on the area concerned are covered by gravel and lime stone dust. Only two paths leading from the top of spoil heap to playground are designed of mineral-and-resin surface because of steep slope. They provide extreme steep for walking path to give expression of spoil heap height. Along one of that paths will be line of slides for children play. On the main area of the playground is designed wooden construction in the form of industrial structure with some connotations to coal mine lift tower, drift or some iron and zinc factory dwellings. Additionally were designed various slides and modern play equipment which may be associated with industry but giving the same time high quality play proposition.

On southern slope will be left some spots of metallophyte plants. They will create rhythms of rectangular forms or are designed as circles. Nearby are put educational boards with information about that kind of plants.

On the whole area are designed boards of educational path with information about local history, industrial revolution, zinc production technology, features of spoil heap material, metallophyte plants, spontaneous flora, birds living around and area information system.



4. ANNEXES

List of areas in the green infrastructure system for the Action plan for Ruda Śląska FUA in LUMAT project

Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ area surroundings	Present ecosystem services	Potential ecosystem services
Ruda Śląska					
R1	Areas along Bytomka river 50 ha	Renaturation and creation of recreation areas along the river Education path and points Walking and biking route along the river Vantage points Benches every 100 m Remediation not needed	Area is overgrown by wide greenery (trees, bushes) in the land use plan it is devoted to green areas Area uninhabited along the river. In farther distance housing settlements. It borders with cities of Świętochłowice, Zabrze and Bytom	1 Supply services: - water supply. 2. Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification. 3 Supporting services: - circulation of elements, - primary production, - habitat function, - hydrological cycle.	In future development of culture services. 1. Culture services: - recreation, - cultural resources, - aesthetic functions.
R2.	Post-coal bing in the area of Hlond street in Ruda Śląska - Orzegów Ca 6,0 ha	Recultivation activities Remediation needed Biking routes 3 footbridges over Bytomka river Vantage points Benches every 100 m	in the land use plan it is devoted to green areas The area borders with historical centre of Orzegów district, close to the designed „Rudzki Route” (1 stage)	1 Suply services: - water supply. 2. Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification. 3 Supporting services: - circulation of elements, - primary production, - habitat function, - hydrological cycle.	In future development of culture services. 1. Culture services: - recreation, - cultural resources, - aesthetic functions.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ area surroundings	Present ecosystem services	Potential ecosystem services
R3.	Bielszowicki Creek/Kochłówek river Ca 10,0 ha	Creation of recreation areas along Kochłówek river Biking routes Vantage points Benches every 100 m River embankment Separating of river bed from flood area Adaptation of flood area to the birds habitat (arranging reeds on urban areas) Remediation not needed	Partly flooding area, covered by bushes and trees, in the land use plan it is devoted to green areas Borders with large settlement area, from Chorzów Batory side - abandoned areas and brownfields	1 Supply services: - water supply. 2. Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification. 3 Supporting services: - circulation of elements, - primary production, - habitat function, - hydrological cycle.	In future development of culture services. 1. Culture services: - recreation, - cultural resources, - aesthetic functions.
R4.	Area of medieval castle town of exceptional historical value belonging to the network of places concentrating cultural activities Ca 7,0 ha	Reconstruction and revitalization of the medieval castle and its surroundings place and its surroundings Vantage terrace, outdoor stairs, Education route with visual information elements Concept of land use for the area of medieval castle location is existing Remediation not needed	The area mowed regularly, in the land use plan it is devoted to green areas The area of high potential for recreation in the regional scale. It borders with wastewater treatment plant Barbara	1. Culture services: - recreation, - cultural resources, - aesthetic functions. 2. Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification.	1. Supply services: - water supply, - water cycle
R5.	Forested area after closed Pokój coal mine Ca 5,0 ha	Connection with the recultivated dumping site at 1 Maja street. Reshaping into cultural object along the Industriada Route Establishing of industrial park among existing trees (use of existing slopes and	Forested area, previously dumping site of gangue Coal mine buildings with shaft, other buildings, area used before for coal storage.	Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification.	1. Culture services: - recreation, - cultural resources, - aesthetic functions.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ area surroundings	Present ecosystem services	Potential ecosystem services
		ravines for hanging footbridges with a view to objects connected with coal mining(. Remediation not needed	Residential area with multi-family houses.	Supply services -water services - type of circulation	
R6.	Hugon Hill Ca 15,0 ha	It is proposed to establish protected ecological area similar as in Świętochłowice. The hill is partly located in Świętochłowice Walking and biking routes Vantage points Remediation not needed	Forested area, former excavation places forming the area of big differences in height From Świętochłowice side residential area and garden allotments, from Ruda Śląska side brownfields, post-industrial areas and garden allotments.	Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification. Supply services -water services - type of circulation	1. Culture services: - recreation, - cultural resources, - aesthetic functions.
R7.	Area of Piastowska, Plater and Hlonda streets	Strengthening and protection of natural and recreation function Remediation not needed	Wasteland, partly forested, partly covered with nawłóć Bytomka river, residential, industrial areas	Regulation services: - regulation of air composition, - regulation of soil processes, - regulation of pollution and water self-purification. Supply services -water services - type of circulation	1. Culture services: - recreation, - aesthetic functions.
R	Bicycle routes connecting objects	Bitumastic routes: ul.Goduli ul.Droga do Lipin ul.Czarneleśna ul.Czarneleśna-Hallera ul.1 Maja ul.Kupiecka-Czajkowskiego-Kochłówek ul.Magdziorza-Nowary-Katowicka ul.Chorzowska ul.Dunikowskiego ul.Barbary-Pościecha-Kopalniana-Tunkla ul.Modrzewiowa-Międzybłokowa	920m 150m 550m 730m 2300m 1340m 1520m 110m 420m 2460m 480m		



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ area surroundings	Present ecosystem services	Potential ecosystem services
		ul.Młyńska-Sejmu Śląskiego Routes covered with crushed stone: KWK Halemba-Wirek Railway embankment Along Kochłówka river from railway embankment to wastewater treatment plant from ul.Kaczmarka over Kłodnica river from ul.Zacisze ul.Gaikowa Czarny Staw do Kokocińca	720m 990m 1020m 2090m 340m 2000m 600m 1050m 1450m		
Chorzów					
C1.	Herman Pond Ca 3,8 ha	Revitalization of the pond and its surroundings - cleaning water, bottom sealing, removing „wide” sewage discharging, upgrading of surrounding greenery to improve the landscape and fauna/flora living conditions. Recreation zone for the inhabitants is planned - covered from ZIT Necessary treatment of the pond water and removal of toxic sediments from the pond bottom	Pond polluted with waste water, shore covered with reed. In the neighbourhood a dumping heap of un-stabilized surface, dusting. Residential area from north and west.	1. Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of pollution and self-purification (incl. water self-purification), 2. Supply services - water supply - Water circulation cycle;	1. Culture services: - recreation, - cultural resources, - aesthetic functions.
C2.	„Miner” Valley + area surrounding - previous playing ground and swimming pool	Improving nature state, upgrading recreation values particularly in the area of playing ground and swimming pool Valorization of the area and land use plan is being prepared Remediation not needed	Ponds connected with narrow channel, walking routes around the pond, partly covered with asphalt, benches, bar with beer garden, to the south industrial area forested.	1. Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of pollution and self-purification (incl. water self-purification),	1. Culture services: - recreation, - cultural resources, - aesthetic functions.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ area surroundings	Present ecosystem services	Potential ecosystem services
			In the neighbourhood Natural Landscape Complex „Żabie Doły”, agricultural and industrial areas.	2. Supply services - water supply - Water circulation cycle;	
C3.	Revalorization of Hutników Park/Place	Improvement of natural-aesthetic status of the existing park Remediation not needed	Hutników Park Compact development of Chorzów downtown	1. Culture services: - recreation, - cultural resources, - aesthetic functions. Climate regulation	
C4.	„Żabie Doły” - area of high ecological values The whole area 173 ha	Comprehensive development and continuation of protective activities in the area of „Żabie Doły” Land use project for the area should be done regarding preservation of natural values and promotion of ecological issues, which would be coherent with the project concerning part in Bytom. Construction of recreation infrastructure which would not destroy natural values. The present valorization is existing. Remediation not needed	Flood areas with reed, agricultural areas, abandoned railway banks and areas after their liquidation, re-cultivated post-mining dumps. Agriculture areas, post-industrial areas, small residential areas.	1. Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of pollution and self-purification (incl. water self-purification), 2. Supply services - water supply - Water circulation cycle; Other biological resources Genetic resources - biodiversity 3 Supporting services: - circulation of elements, - primary production, - habitat function, - hydrological cycle.	In future development of culture services. 1. Culture services: - aesthetic functions, - recreation, - science and education.
C5.	Area at Łagiewnicka street Ca 6,0 ha	Revitalization includes creation of green area for recreation on the previous wastes dumping place and small retention. The concept of land use is existing for the part of the area for recreation purposes, from the side of Łagiewnicka street the area is planned for housing estate.	Area not used, partly forested, partly covered with meadow vegetation or goldenrod. Housing estate of multi-family buildings, garden	1. Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of pollution and self-purification (incl. water self-purification),	1. Supporting services: - circulation of elements, - primary production, - habitat function, - hydrological cycle.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ area surroundings	Present ecosystem services	Potential ecosystem services
		Remediation not needed	allotments, cementary, wasteland, not used railway embankment - potentially for biking route.	2. Supply services - water supply - Water circulation cycle;	2. In future development of culture services. Culture services: - aesthetic functions, - recreation,
C.	Bicycle routes connecting objects	Bitumastic routes: Pniaki - Amelung Pniaki - Herman ul. Brzozowa to Kokociniec	1800m 1630m 160m 1640m		
Świętochłowice					
S1.	Area along Sikorskiego and Harcerska streets Ca 3,0 ha	Building of multifunctional sports ground, playing ground, arrangement of greenery. Arrangement of the area around „Zacisze” pond.	Housing estates, diametral highway	1. Culture services: - culture resources, - aesthetic functions, - recreation, - science and education. 2. Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of pollution and self-purification (incl. water self-purification), 3. Supply services - water supply - Water circulation cycle;	3 Supporting services: - habitat function, - hydrological cycle.
S2.	Zgoda district Ca 7,0 ha	Recovery of the public space in the area of Zgoda district. It includes revitalization of Kalina pond (covered by WFOŚ) and Hugona hill. It is proposed to connect Ruda	Hugon hill is an ecological protected area	1. Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena (water surplus), Regulation of	1. Culture services: - cultural resources, - recreation, - aesthetic functions, - science and education.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ surroundings area	Present ecosystem services	Potential ecosystem services
		<p>Śląska through Bałtycka street with Hugona hill.</p> <p>Construction of walking and biking routes on Hugona Hill. Construction of extreme biking sports routes.</p> <p>Construction of footbridges over hollows etc.</p>	Housing estates, garden allotments, industry, wasteland	<p>pollution and self-purification (incl. water self-purification),</p> <p>Regulation of soil processes</p> <p>Soil formation</p> <p>Reshaping of abiotic environment.</p> <p>Improving soil quality</p> <p>Regulation of pollution and self-purification - absorbing of dust pollution</p> <p>Biochemical cycles and accumulation, decomposition, burying chemical compounds</p> <p>Absorbing of gas pollution</p> <p>2. Supply services - water supply - Water circulation cycle;</p>	
S.	Bicycle routes connecting objects	Bitumastic route: ul. Wojska Polskiego-Ceramiczna	830m		
Chorzów - Silesian Park					
PS1	Water objects of the Park.	Regulation of the water system protection against flooding. Construction of the information-education route of plants. Pumping system will be constructed from Przystań to Hutnik ponds (about 800 m). Remediation not needed	Forested area, park-forest zone Small reshaping of trees population allowed, addition of "noble" species	<p>1. Culture services:</p> <ul style="list-style-type: none"> - aesthetic functions, - recreation, - science and education. <p>2. Supply services - water supply - Water circulation cycle;</p> <p>3. Other biological resources Genetic resources - biodiversity</p>	1.Regulation services: Regulation of extreme phenomena (water surplus), water self-purification Regulation of air composition, Climate regulation,
PS2	Exhibition Hall Kapelus (Hat).	Revitalization of the object of a high monumental value. The new education program is established for families. Arrangement of greenery on the object	Exhibition object of bad technical state	1. Culture services: <ul style="list-style-type: none"> - culture resources, - recreation, - aesthetic functions, 	



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ surroundings area	Present ecosystem services	Potential ecosystem services
	Object in the monuments register	surroundings. Solutions decreasing emission of greenhouse gasses with applying modern heating and ventilation systems.		- science and education. 2. Supply services Decoration resources	
PS3 .	Green areas of the Park.	Continuation of the greenery arrangements with biological diversity. Creation of new green thematic zones.	Correction of trees arrangement in areas of intensive recreation function Exchange of trees into species of noble native character Introduction of noble species of high greenery. Arrangement of new thematic gardens	1.Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena, Regulation of soil processes, Regulation of pollution and self-purification (incl. water self-purification), 2. Culture services: - culture resources, - recreation, - aesthetic functions, - science and education. 3. Supply services - water supply - Water circulation cycle; Other biological resources, Genetic resources - biodiversity, Decoration resources	1.Supporting services: circulation of elements, primary production, habitat function, hydrological cycle.
PS4 .	The Park Channel	Reconstruction of the channel banks, construction of bridges, walking route along the channel, modernization of the island Remediation not needed	Park channel offering possibility for kayaks and boats.	1. Culture services: - culture resources, - recreation, - aesthetic functions, 2.Regulation services: Regulation of air composition, Climate regulation, Regulation of extreme phenomena, Regulation of pollution and self-purification (incl. water self-purification), 3. Supply services - water supply - Water circulation cycle;	1.Supporting services: habitat function, hydrological cycle.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/ surroundings	Present ecosystem services	Potential ecosystem services
PS5	Rosarium - rose garden	Revitalization of the rose garden, reconstruction and adaptation to the present forms of flowers exhibition. Also Alpinarium will be established - a garden presenting plants species from mountainous areas. Remediation not needed	Collection of roses, meadow for picnicking, pond with water lilies in natural state and concrete small ponds with miniature lilies, area fenced.	1. Culture services: - culture resources, - recreation, - aesthetic functions, - science and education. 2. Supply services - water supply - Water circulation cycle; Other biological resources Genetic resources - biodiversity Decoration resources 3.Regulation services: Regulation of air composition, Climate regulation, Regulation of soil processes, Regulation of pollution and self-purification (incl. water self-purification),	1.Supporting services: habitat function, hydrological cycle.
PS6	New education routes for school children	Creation of new education routes for school children. Regeneration of 5 spots for amphibian propagation. Not applicable	Education routes on birds, trees and ecology	1. Culture services: - science and education, - culture resources, - recreation. 2.Regulation of pollution and self-purification (incl. water self-purification), 3. Supply services - genetic resources - biodiversity Decoration resources	
PS7	Silesian Zoo	Moderization of the Silesian Zoo includes planting new greenery on the zoo areas. Planting of park greenery on the zoo area. (1000 trees and 20 thous. shrubs,	Zoo garden	1. Culture services: - science and education, - culture resources, - recreation.	1.Supporting services: habitat function, hydrological cycle.



Lp.	Area/Surface area	Action framework (is remediation needed)	Present status/area surroundings	Present ecosystem services	Potential ecosystem services
		arrangement of 500 m2 of fields planted with perennial plants). Dewatering of dinosaurs' hollow Not applicable		2. Supply services - genetic resources - biodiversity	

