

(PP4) PILOT ACTION REPORT

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1. Pilot Action Title

Brownfield regeneration strategy based on public participation principles

2. Place/area of PA implementation

The Pilot Area covers the territory of the former heating plant in Nowa Wola Gołębiowska, incorporated to the municipal heating plant Company Radpec S.A., in the north of Radom.

For decades this area have been neglected, creating a landscape of industrial emptiness. At last local authorities jointly decided to prepare a complex revitalization program.



Picture 1 Heating plant in Radom

3. Duration of PA implementation

First significant research started with CDM Smith examination of surface buildings and ground analysis. The report was published in November of 2017. In March of 2018 the JARS company has completed following research with additional ground analysis and developing two strategies of remediation. The final pilot actions took last three months of the project timespan - creating a local vision in the end of the April of 2019.

4. Costs related to PA

The main costs related to the implementation of the pilot action amounted to approximately 302 308,75 PLN and can be condensed in 6 points.

1. Investment analysis and regeneration of areas - 97 170 PLN
2. Conducting social participation - 37 300 PLN
3. Development of regeneration methodology, taking into account the methods of remediation of post-industrial area soils area - 42 834,75 PLN
4. Analysis of the current situation of post-industrial sites in urban areas of three functional zones: City of Warsaw, the City of Plock and the City of Radom together with the Pionki city area - 28 000 PLN



7. Activities carried out

In 2018, public consultations were held regarding the future development of the post-industrial area. During the discussions at the consultation points and during the summary meeting, numerous issues were identified that constituted important conditions in the designing process and subsequent land development.

The consultations did not directly concern the identification of new functions for existing post-industrial facilities. Due to the nature of the issues presented, they were divided into three groups:

- Development of post-industrial area,
- Communication,
- Safety.

Land development

According to meetings participants, the post-industrial area at Energetyków street needs a complex rearrangement and the old buildings should be adapted for new functions. Additionally there is an urgent need for an overall plan of spatial structure of the area with the expanded access to road network.

Residents indicated the urgency to locate industrial activities there, which would not be burdensome for a people living in the surrounding areas.

The social housing estate, according to the participants, should be equipped with additional social infrastructure located outside the housing estate (playgrounds, promenades, security cameras etc.).

The community of Nowa Wola Gołębiowska pointed out the lack of a sufficient number of stores in the neighbourhood. Moreover the meetings unveiled another need - a places within the analysed area for outdoor, green recreation area. Such places are crucial, especially for young people. The older residents pointed out the lack of organized vegetation, where they could spend their free time with nature (park, pond, grove etc.).

The needs to create both meeting places for the elderly and young people were presented and accepted by the authorities. Consequently they will build a modern backyard gardens in the vicinity of the housing estate at Maria Gajl Street. The argument for improving cultural aspects were considered justified whereas the creation of the cultural centre could be the solution.

Communication

During the consultations, opinions repeated numerous times about the need to improve the condition of road infrastructure in the area of Nowa Wola Gołębiowska, Stara Wola Gołębiowska, Energetyków, Maria Gajl and Huta Józefowska streets.

The optimal solution would be improving local, public transport since it combines economic and ecological values (the distance to Radom centre is not that great)



Inhabitants of Huta Józefowska and the areas around Energetyków Street have submitted the idea of building the “Radom North” train stop with a small car park located near the crossing on Stara Wola Gołębiowska Street. This would allow efficient access to the centre of Radom.

The lack of a collision-free junction of the railway line with the road connecting the analysed area with the city centre was indicated as a significant problem. Entrepreneurs pointed out that streets in the industrial zone should be included in the city street system.

Security

Inhabitants of Nowa and Stara Wola Gołębiowska pointed out that the housing estate at Maria Gajl Street is a dangerous and seriously neglected place to live and this state should change as soon as possible. The residents suggested that in the first step there should be installed surveillance cameras.

The lack of pavements for pedestrians and bicycle paths is another threat to the health and safety of residents - particularly children on their way to school. This applies especially to the streets: Mari Gajl, Nowa Wola Gołębiowska, Stara Wola Gołębiowska and Energetyków.

SWOT analysis of the subject area in the context of Radom case:

The action strategy process focus on achieving the main goals and assumptions from analytical and diagnostic work. Development of the strategy leads to the definition of strategic and operational objectives necessary to achieve the long term values.

To formulate the correct model of the concept strategy for actions aimed at revitalizing areas of the former CHP plant, the SWOT analysis method was used, which helped identify the main internal (strengths and weaknesses) and external conditions (opportunities and threats) relevant to the selection of the development vision of the examined area.

To create a proper conceptual model of actions focused on the revitalization of former heating plant area, the SWOT analysis was used, which allowed identifying the main preconditions, both internal and external, significant to choosing a development vision of the studied area.

The research process itself was carried out in several stages, which consisted of:

1. Developing individual lists of strengths / weaknesses as well as opportunities and threats - each stakeholder independently prepared a list of factors considered by him to be significant from the point of view of developing a vision of the strategy of further actions,
2. Integration of individual lists and development of a SWOT matrix, including the selection of less important factors,

3. The dialogue of participants involved in the research was conducted in the scope of conclusions resulting from the presented integrated list of factors to allow a look at the issues from different points of view,

4. A vision of options for future actions has been developed, including the presentation of preliminary action strategies that should be detailed by land administrators and implemented.

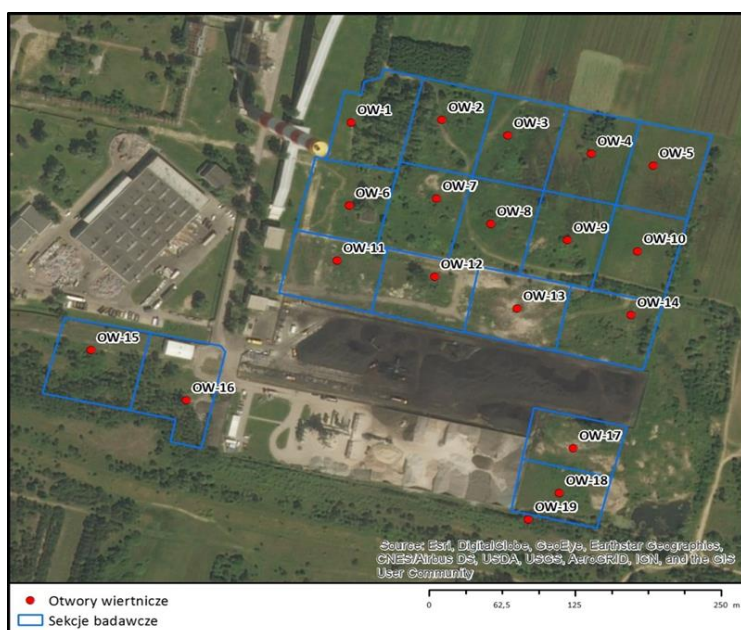
As it was described earlier, the inhabitants of Nowa and Stara Wola Gołębiowska unanimously pointed out that the housing estate at Maria Gajl Street is a place exceptionally in need of quick changes in terms of safety, better communication and general quality of life.

8. Technical specifications and solutions tested

The main technical goal was to develop a regeneration methodology including remediation methods of the post-industrial area at ul. Energetyków 16 in Radom that could be applied to all surroundings. The methodology was developed based on results of earth surface quality tests carried out in two stages:

Stage I - research carried out by CDM Smith Sp. z o.o. including plots No. 9/231, 9/188, 9/106, 9/103, 9/110, located in the vicinity of the former heating plant.

At this stage, an in-depth analysis of the condition of the former heating plant in Radom was carried out in terms of the current state of soil and buildings located in this area in terms of industrial pollution and technical condition. Analysis allowed more detailed identification of threats resulting from condition of the natural environment, waters and impact on the health and life of residents.



Picture 3 Area of soil-water environment quality tests.
 Research sections are marked in blue and the drilling holes are marked in red



The complete expertise consisted of 5 elements:

1. Environmental and technical analysis
2. Soil and water environment study
3. Assessment of significant risks to human health or the environment
4. Assessment of technical condition of the heating plant
5. Recommendations on development options

The table below presents a general summary of the area's potential and development possibilities:

EVALUATED ELEMENTS		POTENTIAL CONSEQUENCES
Site characteristics		
Administrative location	Radom, 6km northeast of the city centre	depending on the purpose of the area
Actual urban land use plan (MPZP)	no	no terrain functions defined
Planning conditions	land to be invested without restrictions	significant development possibilities
Underground infrastructure		
electric and tele technical network	yes	area well connected and equipped with utilities - significant development possibilities
gas network	yes	
sanitary network (water supply, sewerage)	yes	
road and rail network	yes	
Ground infrastructure		
Constructions and buildings	yes	necessity of demolition
Environmental conditions		
protected areas	no	
land morphology	very diverse	levelling recommended in most cases
land pollution	yes	detailed research, remediation



Stage II - research carried out by JARS Sp. z o.o. including plots 9/177, 9/187, 9/105

In the second stage, apart from the research, the accumulated knowledge was collected and two variants of area revitalization were proposed. Both have their pros and cons, but the final choice depends on the local decision maker.

Soil regeneration concept - Variant 1

Assisted self-cleaning: FITOREMEDIATION

Advantages

- minimal impact on the natural environment and its aesthetic values,
- simplicity and low hardware requirements,
- small capital expenditure in relation to other treatment methods,
- high efficiency and effectiveness for selected substances.

Disadvantages

- process duration related to vegetation periods, and thus related with climatic conditions,
- not always satisfactory purification effects (for selected substances and their high concentrations)
- necessity of biomass utilization
- the possibility unplanned introduction of foreign species into local ecosystems, including invasive ones

Soil regeneration concept - Variant 2

Ex-situ method using THERMAL DESORPTION

Advantages

- fast
- high efficiency of dirt removal combined with a low level of residual dirt
- the possibility of using in relation to soils with a very high concentration of impurities
- the method can be applied to most common impurities

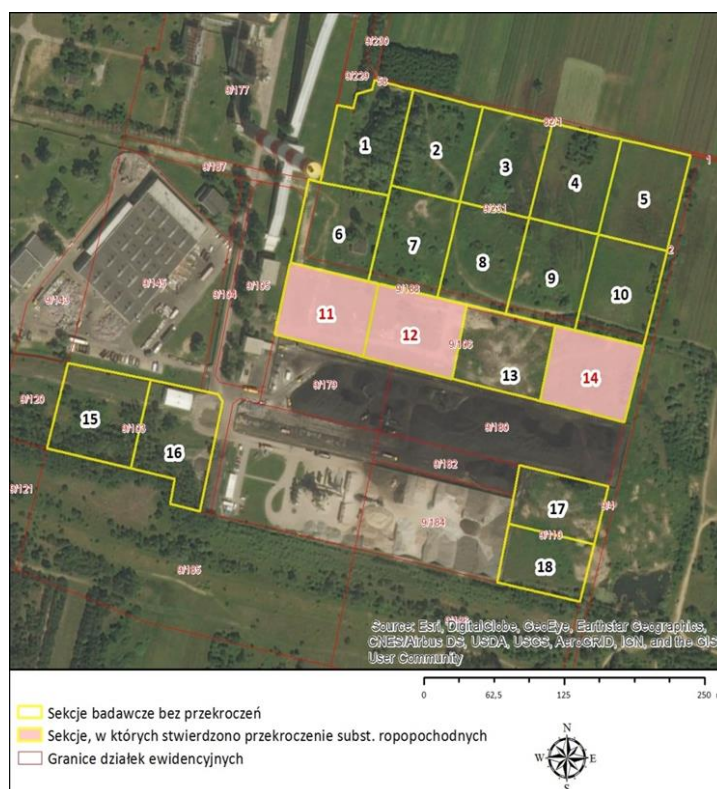


Disadvantages

- the need for extraction contaminated soil / the need to use specialized installations
- low throughput of mobile installations installed at the place of pollution
- high capacity of stationary installations, but the resulting necessity of conducting ex-situ remediation
- very high costs
- complete destruction of soil biological activity

Due to the low values of the substance concentration in the surface soil layer, which slightly exceeded the permissible values specified for group I soils, there was a proposal not to carry out works related to soil replacement and ex situ remediation. Due to relatively low pollution and high soil potential for self-cleaning of petroleum substances, natural bioremediation will be the most appropriate from a natural but also economic point of view, possibly supported by in situ phytoremediation.

In order to intensify phytoremediation, contaminated sections at the beginning of the growing season can be fed with species well accumulating and metabolizing petroleum substances, such as plantago lanceolata and white clover *Trifolium repens*.



Picture 4 Area where exceedances of oil derivatives were found.

Empty brackets - Research sections without exceeds

Filled brackets - Sections in which the petroleum substance was exceeded

Other - borders of registration plots

These species are adapted to moderate light, resistant to periodic water shortages, for which sandy or loamy soils are the habitat. It was advised to periodically carry out care treatments consisting of mowing herbaceous vegetation and removing biomass.



In the situation that the land development project within the registration plot 9/177 assumes the construction of a different building than the existing one, as well as a different layout of communication routes, and thus interference in the surface layer of soil, it is possible to perform remediation by the ex situ method, by partial replacement contaminated land, as well as by covering contaminated land, in accordance with the design assumptions of the new land development, which takes into account the zoning of the area for residential and commercial buildings without the possibility of agricultural and recreational use.

The estimated volume of removed earth masses is:

Area of the former heating plant	- 3778 m ³
Areas located in the vicinity	- 3750 m ³
TOTAL:	- 7528 m³ ≈ 13 550 Mg

Estimated cost of remediation by the EX-SITU method - 680 000 PLN

The costs of implementing the full Variant I (Phytoremediation) were not possible to accurately estimate, due to the natural limitations of this method (e.g. plant acceptance, pace of cleansing, vegetation periods associated with weather fluctuations). However, the cost of the process should fluctuate around PLN 200,000, constituting the main economic argument for choosing this option.

9. Impact/ results/ experience (how many target groups/ stakeholders were reached, pilot events

The areas included in the former Radom Heating Plant ("Pótnoc") allow to consider several concepts of their development, including revitalization, which are considered by the interested groups that influence the future course of action.

The main goal of revitalizing the degraded area was to change the existing functions, adapt the area and the existing facilities for other purposes. The nature of the analysed area, especially its current functions, location, communication with the rest of the city, availability of basic technical infrastructure point to two main directions of revitalization activities:



- Restoration of the production function in the entire analysed area, which is consistent with the currently applicable Study of Conditions and Directions of Spatial Development.
- The second possible direction of revitalization assumes the introduction of an industrial function for the greater part of the analysed area, and a service function for the rest, including the location of public facilities and areas, such as, for example, a public recreational area with all required elements: sport infrastructure for youth, vegetation sites for the rest. Even more complex solution would be additionally building local entrepreneurship centre for the development of professional skills. The last, most expensive and risky option would be revitalizing several buildings and readapting area on cultural, social and business level.

10. Contribution to project objectives

The pilot action at the heating plant in Radom positively contributed to the overall achievement of the project's goal, and in particular the specific goal of providing valuable solutions for degraded areas, rehabilitation by identifying more appropriate financial, regulatory and environmental rehabilitation instruments and presenting land management proposals. The proposed solutions may have a positive impact on the environment for the City of Radom and other entities and may contribute to greater efficiency in managing brownfield sites in accordance with the principle of sustainable economic, environmental and social development.



11. Transnational added value - how PA contributed to other activities implemented by the project & added value for partners

ARMSA benefitted from the joint implementation of project activities acquiring useful knowledge of brownfield management during the different training opportunity provided within the project: training seminars, study visits, and pilot site visits. At the same time, the City of Radom offered their partners different occasions for knowledge and good practices' exchange. The results from the pilot action can be



useful to the partners which have similar aims and interests. Lessons learned and solutions stemming from the pilot action will contribute to the elaboration of the booklets on sustainability measures and will be included in the catalogue of lessons learned.

The pilot action in Radom aims to improve environmental management in unused and degraded industrial areas. At the same time, it should be noted that PA also included urban tissue. Reusing degraded areas will create new jobs in the future as well as meeting places for residents. However, the above elements can be met only when the soil has been completely cleaned of impurities.

12. Compliance with the sustainability principles

Pilot activities in Radom were carried out in accordance with the latest EU guidelines on the assumptions of good practices.

The involvement of people with deep social exclusion and their alleged negative attitude has created the requirement to choose the right and effective method of consultation. The adopted solution included a combination of various methods including an innovative, very demanding method of real planning (PFR). Public consultations were conducted with the residents of three housing estates located near the degraded area.

Not only the social problem was the subject of the pilot action, but also a problem related to the remediation of the area as well as its further development.

Pilot activities in Radom strongly emphasized the importance of strong relations between the regional institution (ARM SA) and local authorities (city of Radom) and the relatively low interest of other stakeholders. Cooperation with the city of Radom was an important and fruitful lesson for the leader of Pilot Activities. Local authorities actively supported the project and provided it with valuable assistance thanks to extensive experience in implementing projects related to social and economic regeneration.