

**REGIONAL DIRECTOR FOR
ENVIRONMENTAL PROTECTION
IN CRACOW**

OO.420.4.1.2018.BM

Cracow, 24 January 2019

**DECISION
ON MODIFICATION OF DECISION
ON ENVIRONMENTAL CONDITIONS**

Based upon Article 104, Article 107 (1), Article 108, and Article 155 and Article 49 (1) of the Act of 14 June 1960 Administrative Proceeding Code (OJ of 2018, item 2096, as amended), and also based upon Article 87 in reference to Article 63, Article 71 (2) item 2, Article 74 (1) and (3), Article 75 (1) item 1 letter i), and Article 75 (1) item 1 letter p), as well as Article 75 (1) item 1a, and Article 84 and Article 85 (2) item 2 of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments (OJ of 2018, item 2081, as amended), and based upon Article 17 of the Act of 8 July 2010 on the special preparation rules for flood protection investments (OJ of 2018, item 433, consolidated text), as well as Article 3 (1) items 60 and 65 of the regulation of the Council of Ministers of 9 November 2010 on the investments which may significantly affect the environment (OJ of 2016, item 71, consolidated text),

after considering

the application dated 05/07/2018 (reception date: 05/10/2018), ref. no.: KR.JRP.081.8.11.2018, as provided by the Investor, i.e. State Water Holding Polish Waters Regional Water Management Authority in Cracow, 22. Marszałka J. Piłsudskiego Street, 31-109 Cracow, represented by Mr. Radosław Radoń – Manager of the Odra-Vistula Flood Management Project Implementation Office at the Regional Water management Authority in Cracow, supplemented with formal parts with notes: dated 06/06/2018 (reception date: 06/07/2018), ref. no.: KR.JRP.081.8.11.2018; dated 06/27/2018 (reception date: 06/27/2018), ref. no.: KR.JRP.081.8.11.2018; dated 07/05/2018 (reception date: 07/06/2018), ref. no.: KR.JRP.081.8.11.2018; and dated 07/13/2018 (reception date: 07/16/2018), ref. no.: HTK/AD/1500/1310/18; and supplemented with substantial parts related to the IDS with notes: dated 10/05/2018 (reception date: 10/09/2018), ref. no.: HTK/AD/15007/1755/18; dated and dated 11/09/2018 (reception date: 11/09/2018), ref. no.: HTK/AD/15007/1933/18; updated with clarifications submitted by e-mail on 12/20/2018, ***on modification of a decision on environmental conditions issued by the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.3.2016.BM for the investment titled: "Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 3 - the right embankment of the Vistula from the Dąbie barrage to the Przewóz barrage"***, in the following scope:

- Modification of chainage provided, including division of the investment into tasks;
- Implementation of additional data on the area of properties or their parts, which would remain a part of the investment, and are necessary for its implementation, and which become properties of the State Treasury;
- Modification of chainage for deposits;

- Implementation of additional IV type of typical section and of provision on the possible shaping of the embankment slope to the value of 1:0.5;
- Modification of chainage provided for particular types of typical embankment sections;
- Modification of provisions related to descend roads and embankment crossings in the scope of names of works, as result from the construction law and from the description of descend roads' courses, as agreed with ZIKiT;
- Implementation of information associated with the location of maneuvering sites;
- Implementation of corrective information on redevelopment and demolition of the existing culverts;
- Implementation of information correcting chainage of membranes in the embankments' bodies;
- Modification of provisions in the decision in reference to protected areas.

after obtaining an opinion of the

State District Sanitary Inspector in Cracow of 11/27/2018 (reception date: 11/29/2018), ref. no.: NZ-PG-420-340/18 ZL/2018/11/357, and of the Minister of Maritime Affairs and Inland Navigation dated 12/21/2018 (reception date: 12/21/2018), ref. no.: DOK.DOK2.9750.13.2018.SW PW:69366,

I hereby decide as follows:

I. I state that it is not necessary to perform an environmental impact assessment for the subject modification of the decision on environmental conditions.

II. I modify the decision of the Regional Director for Environmental Protection in Cracow on environmental conditions dated **01/27/2017**, ref. no.: **OO.4233.3.2016.BM**, as follows:

In the conclusion:

1. I modify item 2 of the environmental decision dated 01/27/2017, ref. no.: OO.4233.3.2016.BM, in reference to characteristics of the investment, and provide new contents titled **"Appendix no. 1 – New Characteristics of the Investment"**, which forms an integral parts of the modified decision.

In the justification:

2. Item 1a. "Type and character of the investment including the following:"

"Scale of the investment and size of acquired land, and their mutual proportions, as well as significant solutions specific for the investment."

gains the following new meaning:

The planned investment comprises the redevelopment and extension of about 11 km long section of embankments for the River Vistula, i.e. the right Vistula embankment from the Dąbie Barrage to the Przewóz Barrage at working chainage of the embankment from km 0+000 to km 10+678.

Except for the redevelopment and extension of the existing flood embankments for the River Vistula, the scope of application also covers redevelopment or protection of the related accompanying infrastructure (embankment locks, descend roads and embankment crossings), and construction, redevelopment, protection or liquidation of the existing road infrastructure (roads, culverts, ramps –

descend roads and embankment crossings), power network, gas network, IT network, water supply network and sewerage network.

The planned investment shall be implemented in accordance with the requirements of the regulation of the Minister of Environment of 04/20/2007 *on the technical conditions for hydraulic structures and their location*, with required safe freeboard for hydraulic structures as in Class I, with deviation related to determination of design flow and control flow in reference to Q1% and Q0.2%, respectively, without estimation mistake.

The deviation from technical and engineering regulations for that section of embankments is a result of continuation of gradeline for the embankments, based upon the same rules for the entire length within Cracow. A section between the Dębnicki Bridge and Wawel was a deciding factor for deviation from technical and engineering regulations and for lowering of the gradeline, due to the following reasons:

- Practically unrealistic implementation of extensive redevelopment of control network for bridges and access roads within the historic city center,
- Technical difficulties associated with extension of the existing embankments in the area of dense urban development, and especially extension of the existing stone walls located in a small distance from windows of buildings located e.g. along Kościuszki Street,
- Architectural and landscape reasons – necessary rising of the stone wall on the crest of the left embankment between the Dębnicki Bridge and Wawel, a height of which would need to reach not about 1.0 m, as it is now, but to about 2.3 or even about 4.0 .

The same level of flood protection is continued within the current section.

The table given below provides chainage of the embankments covered by the investment, including corresponding working chainage.

Planned investment	Register chainage km		Working km
	Embankment km	Respective river km	Embankment km
3.1	81+193	81+256	0+000
	82+127	82+909	0+934
3.2	82+149	82+931	0+956
	87+081	87+899	5+888
3.3 within the Municipality of Cracow	87+095	87+913	5+902
	90+519	92+150	9+326
3.3 within the Commune of Wieliczka	90+519	92+150	9+326
	91+850	92+800	10+678

Scale of the planned rising for the flood embankments shall amount to:

Section of the modernized embankment divided into tasks	Highest [m]	Lowest [m]	Average [m]
3.1	0.42	0.08	0.25-0.35
3.2	0.95	0.00	0.40-0.5
3.3	0.85	0.00	0.55-0.7

The subject investment is on the right bank of the River Vistula. Section of the embankment to be redeveloped starts at the port located at the downstream station of the Dąbie Barrage. It overlaps the route of present embankments, crosses the body of Nowohucka Street, bypasses the Lasówka Fort, crosses Półanki Street, and reaches – with a wide arc – the Przewóz Barrage and the Vistula's oxbow lake, and ends at junction with embankments of the River Serafa. The boundaries between the Municipality of Cracow and the Commune of Wieliczka run through the embankment at chainage km 92+000 of the Vistula River (embankment chainage km 90+800 – working chainage km 9+326).

The analyzed embankment section starts at the Płaszów Port (downstream of the Dąbie Barrage), at the end of Na Zakolu Wisły Street. A dirt road is located on the embankment. "Zakole Wisły" garden allotments are located from km 0+100 to km 0+930 (working chainage of the embankment), in the area beyond the embankment. The embankment crosses Nowohucka Street at chainage km 0+945. The embankment protects houses and Małopolski Ośrodek Ruchu Drogowego [Małopolskie Traffic Center] from km 0+956 up to km 2+100, where garden allotments – reaching chainage km 2+600 – are located; the dirt road also continues its route there. Habitats of beavers are located within the embanked area between km 1+400 and 2+150. The embankment bypasses the Lasówka Fort – a historic object – in a reach from km 2+900 to 3+100. Numerous stands of beaver are located within the embanked area from km 4+000 up to km 7+000 (in sections: km 4+000 – 4+300, km 4+400 – 4+800, km 5+100 – 5+500, km 6+300 – 6+500, km 6+700 – 7+000). At chainage km 5+895 the embankment cross Półanki Street and turns into the Wanda Bridge, and at chainage km 7+450 the embankment crosses the construction site for S7 route. Habitats of beavers are located within the embanked area in a reach from km 9+000 to 10+678, mainly within the oxbow lake at the Przewóz Barrage. The embankment ends at km 10+678, just downstream of the Przewóz Barrage, in vicinity of the estuary of the River Serafa, and joins the embankments of that river.

Currently the height of the flood embankment existing in Section 3 is from about 2.8 m to about 3.8 m. Width of the crest in sections beyond the crossings is from about 2.35 to about 3.6 m. Grade of the riverside slope is from 1:2.1 to 1:2.56. Grade of the landside slope is from 1:1.75 to 1:2.

In case of the designed embankment the minimum parameters were adopted as follows: crest width of about 4.0 m, grade of the riverside slope of 1:2.5 and of the landside slope of 1:2.0. The maximum height of the embankment shall rise to about 4.3 m. In exceptional cases the slopes may be shaped to a value of 1:0.5 in order to limit the acquisition of protected land or the collision with buildings or structures.

A structure remaining a right abutment of the overpass holding heating pipes from the Łęg Thermal Power Station to receivers in the southern part of Cracow is located in so-called section 3 to be redeveloped between km 1+245 to km 1+345. Due to the placement of the structure in the

embankment body, the modernization works shall not include any work, except for covering the area at the embankment with 0.2 m thick layer of ground, which results from the shortage of embankment height in that section. The structure shall not be redeveloped.

A road runs along the riverside of the modernized embankment, between chainage km 0+020 and km 0+515, and remains a reinstatement for the existing dirt road. That road allows the owners of plots located within the Vistula's embanked area to access public roads. Modernization of the embankments in the range of raising their crest and of developing a membrane results in damages to that road. For the purpose of keeping the existing conditions it shall be redeveloped along the embankment after completion of the works.

The embankment performs its main function of a flood embankment within the entire section. The slopes and the embankment crest are covered with grass / herbaceous plants. Sectionally, there are some roads of various courses on the crest. The embankments are regularly mown. The embankments cross such technical infrastructure as roads, water supply system, sewerage, heating and gas networks, and power and teletechnical lines.

Currently, the width of the embanked area in a modernized reach is as follows:

- a. Between the Dąbie Barrage and the Wandy Bridge (from km 80+900 to 87+900) – from 311 m (at the Dąbie Barrage – transient section between the boulevard facilities and the embankments) to 511 m in the area of Białuchna estuary (about km 82+000). The embanked area's width in that section is about 420 m, on average.
- b. Between the Wandy Bridge and the Przewóz Barrage (from km 87+900 to km 92+000) – from 404 m to 500 m, 460 m on average. An exception is the area of the Przewóz Barrage, where the embankments also protected the Vistula's oxbow lake with the estuary of Drwina, where the embanked area's width reaches 1100 m.
- c. Between the Przewóz Barrage and the estuary of Suchy Jar (from km 92+000 to 96+500) – from 445 m to 482 m, 460 m on average.
- d. Section of the Dłubnia River estuary between the estuary to the River Vistula and Ptaszyckiego Street – from 161 m to 270 m.

Due to rising of the crest of existing embankments and due to their extension toward the embanked areas, the area shall be narrowed in reference to the maximum relocation of the crest towards the Vistula River – by 2 m, and the embankment basis as follows:

- a. For Vistula embankments, section no. 1, up to 4 m,
- b. For Vistula embankments, section no. 2, up to 7 m,
- c. For Vistula embankments, section no. 3, up to 4 m,
- d. For the right embankment at Dłubnia, up to 6 m,
- e. For the left embankment at Dłubnia – 4 m.

At inclusion of the modernization scope for embankments in sections 1, 2, and 3, the minimum narrowing of the embanked area is as follows:

- a. Between the Dąbie Barrage and the Wandy Bridge (from km 80+900 to 87+900) – embanked area narrowed by 3 m, i.e. 0.7% of average width.
- b. Between the Wandy Bridge and the Przewóz Barrage (from km 87+900 to km 92+000) – embanked area narrowed by 6 m, i.e. 1.3% of average width.
- c. Between the Przewóz Barrage and the estuary of Suchy Jar (from km 92+000 to 96+500) – embanked area narrowed by 4.5 m, i.e. 1.0% of average width.

- d. Section of the Dłubnia River estuary between the estuary to the River Vistula and Ptaszyckiego Street – embanked area narrowed by 7 m, i.e. 4.3% of average width.

The impact of narrowing value for the embanked area on additional flood water damming has been estimated in conditions of gradually varied steady flow. At estimations for design water $Q_{1\%}$, which decided on the target height of embankments, the calculations – done with efficiency of 0.01 m – did not prove a necessity of additional height correction due to that reason. In case of the River Dłubnia in its estuary section a deciding factor is a flood on Vistula, backwater of which does not reach Ptaszyckiego Street at very low velocities of water flowing through the Dłubnia riverbed. Therefore, the width of embankments at the Dłubnia River and the volume of water flowing in it do not decide on the height of backwater embankments from the estuary to Vistula to Ptaszyckiego Street, despite the small spacing between them. To sum up, one shall state that potential additional damming associated with narrowing of the embanked area due to modernization works does not exceed 0.01 m, which is a negligible value for the adopted safety margin of 1.0 m above the elevation of design water.

For the purpose of redeveloping and extending the embankments it is mostly planned to apply the basic section – so-called type I. It is specified by extension of the embankment body on the embanked area's (river) side, reinforcement of the crest with gravel mix on geo-textile and voussoir, and service road at the buttress or at the landside embankment's foot (locally the road may move away from the embankment basis to e.g. bypass and protect objects of habitats located within the embankment route), hardened with sand ballast on geo-textile, breakstone and voussoir for the purpose of service vehicles' traffic.

Furthermore, in accordance with information provided in supplementation to the IDS, in locations where due to environmental and maintenance reasons or due to the lack of space it would not be possible to provide redevelopment according to type I and type II sections, type III was introduced, which comprises development of a membrane starting from the embankment crest, using the same technology as in case of the membrane applied in the subbase for type I and type II section. Sections for chainage km 0+974 and km 9+105 present descend roads.

Additional type IV for extension of the embankment was implemented for section located between km 7+420 and km 7+495, and it results from completion – during the designing – of an investment associated with construction of S7 route between the Biezanów junction and Igołomska Street. In a reach where type IV of embankment extension was applied, the bottom of a road bridge is placed about 4.5 m above the crest of existing embankment. Within the framework of bridge development works associated with protection of the existing embankment with gabion mattresses were done, and in the axis of the embankment a membrane – made of sheet piles – was driven into a depth of 15 m from the embankment crest. Due to necessary maintenance of project's durability for the works performed in the scope of GDDKiA investment, and necessary maintenance of vertical gauge between the bridge bottom and the embankment, type IV of extension was implemented, and it includes leaving the embankment crest at the existing elevation, with obtainment of the required elevation using a concrete wall with stone cladding. The solution is similar to the ones applied at modernization of embankments in the area of Wawel.

For each type of cross-sections the following slope inclination was adopted – as a rule confirmed by static calculations:

- Riverside slope – 1:2.5;
- Landside slope – 1:2.

In exceptional cases the slopes may be even shaped to a value of 1:0.5 in order to limit the acquisition of protected land or the collision with buildings or structures.

Types of sections applied within analyzed sections of the redeveloped embankment are given in the table below.

Type of applied section	Starting chainage	Ending chainage
SECTION 3.1 (from the Dąbie Barrage to Nowohucka Street)		
TYPE II	0+000	0+029
TYPE I	0+029	0+909
TYPE II	0+909	0+934
SECTION 3.2 (from Nowohucka Street to Półanki Street)		
TYPE II	0+956	0+977
TYPE I	0+977	1+222
TYPE II	1+222	1+297
TYPE I	1+297	2+920
TYPE II	2+920	2+960
TYPE III	2+960	3+144
TYPE II	3+144	3+420
TYPE I	3+420	4+645
TYPE II	4+645	5+546
TYPE I	4+773	4+645
TYPE II	4+645	4+773
TYPE I	4+773	5+546
TYPE II	5+546	5+682
TYPE I	5+682	5+871
TYPE II	5+871	5+888
SECTION 3.3 (from Półanki Street to the Przewóz Barrage)		
TYPE II	5+902	5+920
TYPE I	5+920	6+390
TYPE II	6+390	7+420
TYPE IV	7+420	7+495
TYPE II	7+495	7+747
TYPE I	7+747	8+911
TYPE II	8+911	9+156
TYPE I	9+156	9+686
TYPE II	9+686	10+213
TYPE I	10+213	10+591
TYPE II	10+591	10+678

The rising designed for any of the sections does not run beyond the existing embankment. The rising reaches the embanked area mainly. It is most often caused by neighboring development or facilities on the landside (area beyond the embankment).

A structure remaining a right abutment of the overpass holding heating pipes from the Łęg Thermal Power Station to receivers in the southern part of Cracow is located **in section 3** to be redeveloped

between km 1+245 to km 1+345. Due to the placement of the structure in the embankment body, the modernization works shall not include any work, except for covering the area at the embankment with 0.2 m high layer of ground, which results from the shortage of embankment height in that section. The structure shall not be redeveloped.

Within the entire reach of modernized embankments (except for the section at sediment ponds on the left bank at chainage of the River Vistula from 90+600 to 91+200) membranes shall be developed in the subbase underneath the embankment body. Depth of the membrane results from specific geological formation of the rivers' subbase in Carpathian dales, which has been confirmed with geological tests.

Within the framework of the planned investment a membrane was designed for the following sections:

- **Section 3 right embankment of the River Vistula from km 0+007 to km 0+922**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 0+966 to km 2+925**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 2+925 to km 3+142 (Lasówka Fort)**, with a membrane developed from the embankment crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- **Section 3 right embankment of the River Vistula from km 3+142 to km 5+878**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 5+910 to km 7+394**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 7+394 to km 7+506**, with a membrane developed within the embankment axis using sheet piles driven to a minimum depth of 6 m below the ground level.
- **Section 3 right embankment of the River Vistula from km 7+506 to km 10+678**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.

Within the framework of the investment it is planned to redevelop, construct, remove embankment crossings and descend roads, and embankment culverts (locks). The planned new descend roads most often join the embankment crest with a shelf on the embankment or they remain a bypass of objects in the embankment course (e.g. existing sewerage chambers) or a link with bicycle path. The descend roads joining public roads shall be developed as asphalt ones within sections of several meters.

Reinforced-concrete openwork road slabs were applied for embankment crossings and descend roads, and in case of asphalt roads administered by ZIKiT in Cracow or by ZDP in Wieliczka – asphalt concrete. Their application is necessary to protect the embankment crest against excessive passing over. The application of open-work slabs shall allow for simultaneous maintenance of the surface as partially permeable. In order to limit the area acquired by embankments of embankment crossings

and descend roads – as those often are arable fields – the grade of slopes beyond the embankment was increased to 1:1.5 and within the embanked area to 1:2.

The table given below presents location of the existing and of new descend roads and crossings.

Descend road no.	Embankment working km	Embankment register km	Existing/new descend road	Description
1	0+010	81+203	existing / redeveloped	Embankment crossing – junction with a road, plot of State Treasury (Na Zakolu Wisły Street)
2	0+030	81+223	New	Exit from service road – junction with a road, private plot (Na Zakolu Wisły Street)
3	0+515	81+708	existing / redeveloped	Embankment crossings
4	0+800	81+993	New	Descend road from the crest to a private plot
5	0+934	82+127	new	Descend road – junction of a pedestrian and bicycle path with a pavement (Nowohucka Street), plot of State Treasury
6	0+934	82+127	existing / redeveloped	Descend road – junction of the road on shelf with a pavement (Nowohucka Street), plot of State Treasury
7	0+956	82+149	New	Descend road – junction of a pedestrian and bicycle path with a pavement (Nowohucka Street), plot of State Treasury
8	0+974	82+167	existing / redeveloped	Embankment crossing
9	0+977	82+170	New	Descend road from the crest to a road on shelf
10	1+221	82+414	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of State Treasury
11	1+222	82+415	New	Descend road from the crest to a road on shelf
12	1+254	82+447	existing / redeveloped	Descend road from the crest to a private plot
13	1+300	82+493	New	Descend road from the road on shelf to a private plot
14	1+316	82+509	New	Descend road from the crest to a private plot
15	2+046	83+239	Existing – to be removed	Embankment crossing
16	2+119	83+312	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the Municipality of Cracow
17	2+670	83+863	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Golikówka)

				Street)
18	2+920	84+113	New	Descend road from the road on shelf, plot of the Municipality of Cracow
19	2+944	84+137	New	Descend road from the crest to a road
20	3+128	84+321	New	Descend road from the crest – junction with a road, plot of the Municipality of Cracow (Golikówka Street)
21	3+388	84+581	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Golikówka Street)
22	3+420	84+613	New	Descend road from the road on shelf – junction with the road, plot of the Municipality of Cracow (Golikówka Street)
23	3+722	84+915	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow
24	3+923	85+116	existing / redeveloped	Embankment crossing – junction with the dirt road, private plot
25	4+266	85+459	existing / redeveloped	Embankment crossing – junction with the dirt road, private plot
26	4+395	85+588	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Golikówka Street)
27	4+690	85+883	New	Descend road from the crest to a road on shelf
28	4+720	85+913	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the Municipality of Cracow
29	4+732	85+925	New	Descend road from the crest to a road on shelf
30	5+586	86+779	New	Descend road from the crest to a road on shelf
31	5+644	86+837	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Szparagowa Street)
32	5+648	86+841	New	Descend road from the crest to a road on shelf
33	5+871	87-064	New	Descend road from the road on shelf – junction with the dirt road, plot of the Municipality of Cracow
34	5+888	87+081	New	Descend road – junction of the pedestrian and bicycle path with the pavement (Półnaki Street), plot of the Municipality of Cracow

35	5+902	87+095	New	Descend road – junction of the pedestrian and bicycle path with the pavement (Półnaki Street), plot of the Municipality of Cracow
36	5+920	87+113	New	Descend road from the road on shelf – junction with the dirt road, plot of the Municipality of Cracow
37	6+382	87+575	New	Descend road from the road on shelf to a private plot
38	6+432	87+625	New	Descend road from the crest to a road on shelf
39	6+445	87+638	New	Descend road from the crest to a private plot
40	7+058	88-251	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Pod Wierzbami Street)
41	7+205	88+398	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the State Treasury
42	7+643	88+836	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the State Treasury (Bugaj Street)
43	7+697	88+890	New	Descend road from the crest to a road on shelf
44	8+673	89+866	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow
45	8+957	90+150	New	Descend road from the crest to a road on shelf
46	9+105	90+298	existing / redeveloped	Embankment crossing
47	9+111	90+304	New	Descend road from the crest to a road on shelf
48	9+721	90+914	New	Descend road from the crest to a road on shelf
49	9+724	90+917	existing / redeveloped	Embankment crossing – junction with the road (Łutnia Street)
50	10+210	91+403	existing / redeveloped	Embankment crossing – junction with the road (Łutnia Street)
51	10+213	91+406	New	Descend road from the crest to a road on shelf
52	10+631	91+824	New	Descend road from the crest to a road on shelf

Tabulated summary of culverts (embankment locks) planned for redevelopment.

Culvert no.	Embankment km	Embankment register km	River km	Diameter [cm]	Remarks	Q1% [m ³ /s]	Designed diameter [cm]	Remarks
P.3.1	1+060	82+253	83+040	50x50	Object with reinforced-concrete abutments. Outlet reinforced with concrete slabs and grates, with a steel flap.	1.02	Ø100	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.2	2+637	83+830	84+430	52x50	Object with reinforced-concrete abutments. Bottom at the inlet reinforced with precast concrete trench, outlet reinforced with concrete slabs and grates, with a steel flap	2.96	Ø110	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.3	3+095	84+288	84+728	55x50	-	0.002	-	Does not require redevelopment.
P.3.4	5+166	86+359	86+952	50x80	Object with reinforced-concrete abutments, bell-shaped section. Inlet and outlet reinforced with concrete slabs and grates, with a steel flap	1.06	Ø90	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.5	6+442	87+935	88+482	Ø80	Object with reinforced-concrete abutments. Outlet reinforced with concrete slabs and grates, with a steel flap.	0.74	-	Redevelopment of the culvert including its extension in the outlet section. Demolition of the existing abutment and construction of a new outlet abutment with a return valve. Development of revetments for the bottom and for slopes in inlet and outlet sections.
P.3.6	7+274	88+467	89+014		Totally silted culvert, with no opening for the abutments and for the hole itself.	-	-	Demolition of the culvert.
P.3.7	9+330	90+532	91+790	Ø90	Object with	1.24	Ø100	Demolition of the

					reinforced-concrete abutments, bell-shaped section. Outlet reinforced with concrete grates, outlet with a steel flap.			culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.8	9+851	91+044	92+014	Ø60	Outlet reinforced with concrete slabs, with a steel flap and a reinforced-concrete abutment.	0.010	Ø100	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.

Construction of service roads requires development of two maneuvering sites:

- Site no. 1 at chainage km 0+909 of the embankment (embankment's register chainage km 82+101) – a yard with dimensions of 12.5 x 12.5 m is located at the end of a service road accessing Nowohucka Street. An exit from Nowohucka Street is closed with a barrier; thus, the maneuvering site allows for U-turn of vehicles without a necessity of obtaining consent for exit from the road administrator, i.e. ZIKIT, in case of everyday use and inspection of the embankments.
- Site no. 2 at chainage km 6+411 (embankment's register chainage km 87+604) – a yard with dimensions of 20 x 20 m is located at the culvert located at chainage km 6+442 (embankment's register chainage km 87+635), and it allows for provision of services and use of the culvert in case of flood event by the investor's staff and by fire brigade.

The subject section of the flood embankment crosses such technical facilities as: roads, water-supply, sewerage, heating and gas networks, power and IT lines.

The subject embankment crosses the following streets:

- Nowohucka Street at chainage km 0+945;
- Szparagowa Street at chainage km 5+645;
- Półtanki Street at chainage km 5+895.

A tabulated summary on information concerning collisions between technical infrastructure with the planned investment, which not necessarily require redevelopment, was given below.

No.	Embankment section	Diameter	Description
GAS			
1	0+977	gsD200	Underneath crossing at km 0+974
2	1+225	gsD200	Underneath crossing at km 1+222
3	2+046	gsD200	Underneath crossing to be removed at km 2+046

4	2+121	gsD200	Underneath crossing at km 2+119
5	7+840	gwA300	H/P Gas
6	7+891	gwA300	H/P Gas
7	7+930	gwA500	H/P Gas
8	7+986	gwA500	H/P Gas
HEATING PIPE			
1	1+291	-	Protected during the performance only
WATER SUPPLY PIPE			
1	0+058	wA	Water supply pipe (sealed)
2	1+291	wA800	-
3	5+644	W100	Water supply pipe underneath the crossing at km 5+644 – distribution network
4	9+708	wA	distribution network
SEWERAGE			
1	0+028	k300	Relocation or protection over a length of about 30 m
2	7+206	k300, k150	Rising of a chamber
POWER			
1	1+291	eWA	High voltage (cable)
2	1+809	-	High voltage
3	2+335	-	High voltage
4	2+873	-	Low voltage
6	8+165	-	High voltage
7	9+698	2xeW	2xeW
8	9+880		Medium voltage
IT			
1	1+115	tD	-
2	1+950	tD	-
3	2+053	tD	-
4	8+381	Cable line	Protection of the cable

Furthermore, in accordance with information provided by the Proxy, it is also planned to protect electric cables with RHDPE-D tubes at chainage km: 0+934, 0+956, 1+291, 5+902, and also at chainage km 4+438 – removal of a post and relocation of a lamp to the neighboring power post, and at chainage km 3+372 – relocation of the post located on the slope.

The planned area determined in the application is about 115 ha. The area of properties or their parts remaining a part of the investment, and necessary for its implementation, which become properties of the State Treasury or a unit of local authorities is about 26 ha.

The basic scope of works contains the works associated with redevelopment and extension of the embankments. Those shall mainly be the earthworks including e.g.:

- Removal of top top-soil layer from the slopes and from the embankment crest, and from the land strip adjacent to the embankment in order to prepare the site for extension (development of embankment);
- Profiling of uncovered slopes for the earth-fill embankment (so-called stair-shaping) and ploughing of the strip of land for the purpose of extension;
- Development of a membrane in the subbase;

- Development of an earth-fill embankment – extension;
- Placement of bentomat;
- Completion of the embankment – extension;
- Placement of a transition layer made of mineral soil;
- Placement of a top-soil layer with sowing using mix of grass.

Works associated with redevelopment of embankment locks – which shall be extended (what is related to the development of new reinforced-concrete abutments and to the redevelopment of descend roads, crossings through the embankment in the course of service roads, field roads or private roads, as well as asphalt public roads) – shall be directly associated with those works.

The basic membrane shall be developed using a bucket-ladder excavator under cover of a thixotropic suspension. Locally, the membranes shall be developed using different excavators, drills for deep soil mixing with injection of cement leaven, or they shall be driven using a pile-driver (vibro-hammer). As a result of increasing of sections of the embankments, it shall be necessary to locally redevelop or protect such infrastructure as: power lines, IT lines, gas networks, water-supply networks, sewerage system, heating system. The investment shall be implemented with the application of general engineering technologies basing upon earthworks, concrete works, reinforced-concrete works, piling works, and installation works mainly. During the works one shall apply such machines as excavators, loaders, trucks, cranes, rollers, concrete mixers, concrete pumps, vibrators and compactors. Implementation of the investment shall not affect landscape values adversely, as the course would not change and new elements would not be introduced to the landscape.

3. Item 1c “Type and character of the investment including the following:”

- c) *“Biological diversity, use of natural resources, including soil, water and earth surface.”*

gains the following new meaning:

It was originally planned to take the soil for construction of the embankments from deposits present in the following locations:

- a) Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area – area of 3.94 ha;
- b) Deposit no. 2 – chainage of the Vistula River about km 89+500, left bank, embanked area – area of 5.59 ha;
- c) Deposit no. 3 – chainage of the Vistula River about km 86+000, right bank, embanked area – area of 2.53 ha;
- d) Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area – area of 2.01 ha;
- e) Deposit no. 5 – chainage of the Vistula River about km 91+200, right bank, embanked area – area of 1.24 ha;
- f) Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area – area of 1.18 ha;
- g) Deposit no. 7 – chainage of the Vistula River about km 85+500, right bank, embanked area – area of 1.68 ha;
- h) Deposit Brzegi, area of 3.09 ha – purchase of materials from KZEK Kraków.

However, after performing geological tests of deposits’ utility for the intake of soil and after establishments made with land owners, the following deposits were left only:

- a) Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area. Due to the significant amount of waste materials deposited in the past that deposit may be used in a small part only for the intake of non-cohesive soil above the table of ground water.
- b) Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area. The deposit is made of up to 3.0 m layer of cohesive soil (loam and loamy sand) placed on non-cohesive soil (medium sand, dusty sand). The level of ground water is about 3.3 m below the ground level. The expected use of up to 3.0 m below the level of ground.
- c) Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area. The deposit is made of up to 1.6 m layer of cohesive soil (sandy dust) placed on non-cohesive soil (fine sand). The level of ground water is about 5.7 m below the ground level. The expected use of up to 3.0 m below the ground level, including cohesive and non-cohesive soil.
- d) Deposit– Brzegi. The area of aggregate extraction by the Krakowskie Zakłady Eksploatacji Kruszyw. In case of layers located at the surface the soil placed in that deposit is waste (KZEK extracts non-cohesive soil and sorts it) for the extraction plant, but it would be a valuable material for the construction of a static body of the embankments. That soil shall be bought from KZEK and delivered to the embedding location. Due to the need for soil in the amount of about 300 K m³, the most of materials to be embedded shall be taken from the deposit in Brzegi.

Sites indicated for the intake of soil from deposits are located within land where plant production is not done, and location of the pits shall not effect in a risk of damaging the flood embankments during the accommodation of flood waves. The adopted extraction levels above the table of ground water – depending on the water level in Vistula dammed at the Przewóz Barrage – allow for the intake of soil in condition allowing for embedding into the embankment body without drying. Simultaneously the scope of extraction would not result in the occurrence of water pits after rainfall or flood, because the pit bottom would be left at the level of highly permeable ground, above the table of ground water. Some kind of inconsistency during floods is the occurrence of water table in the pit with elevation compliant with the water level in the Vistula River (not related to the Brzegi deposit). To sum up, leaving of the pits would not affect the ground water levels and the water environment as the adopted extraction level would not allow for the occurrence of any water environment. In accordance with the extraction project for deposits no. 1, 4, and 6, the contractor shall be obliged to shape the slopes at edges of pits, with grade of 1:2.5, including top-soiling and sowing, after completion of the works

The materials purchased from the Brzegi deposit are natural soil, without pollution, and they shall be embedded above the ground water level; thus, no impact on the water environment and on the water-ground environment is expected in that case.

Furthermore, it is expected to use the following on the investment implementation stage:

- Water: volume of about 1.2 m³/day on average, up to about 3.6 m³/day at the peak of the works;
- Power: depending on the quantity and quality of the equipment used for the work, e.g. concrete mixer. Estimated demand for power on the construction site is about 25 kW.

4. Introduction to item 2 “Location of the investment, including possible hazard to the environment, and especially at the existing and planned land use, self-purification possibilities for the environment and renewal of natural resources, environmental and landscape values and local conditions under spatial management plans.”

Gains the following new meaning:

The subject investment is located on the right bank of the River Vistula. Previous method of use for the analyzed embankment sections:

Section 3 of the embankment starts at the Płaszów Port (downstream of the Dąbie Barrage), at the end of Na Zakolu Wisły Street. A dirt road is located on the embankment. "Zakole Wisły" garden allotments are located from km 0+100 to km 0+930, in the area beyond the embankment. The embankment crosses Nowohucka Street at chainage km 0+945. The embankment protects houses and Małopolski Ośrodek Ruchu Drogowego [Małopolskie Traffic Center] from km 0+956 up to km 2+100, where garden allotments – reaching chainage km 2+600 – are located; the dirt road also continues its route there. Habitats of beavers are located within the embanked area between km 1+400 and 2+150. The embankment bypasses the Lasówka Fort – a historic object – in a reach from km 2+900 to 3+100. Numerous stands of beaver are located within the embanked area from km 4+000 up to km 7+000 (in sections: km 4+000 – 4+300, km 4+400 – 4+800, km 5+100 – 5+500, km 6+300 – 6+500, km 6+700 – 7+000). At chainage km 5+895 the embankment crosses Półanki Street and turns into the Wanda Bridge, and at chainage km 7+450 the embankment crosses the construction site for S7 route. Habitats of beavers are located within the embanked area in a reach from km 9+000 to 10+678, mainly within the oxbow lake at the Przewóz Barrage. The embankment ends at km 10+678, just downstream of the Przewóz Barrage, in vicinity of the estuary of the River Serafa, and joins the embankments of that river.

The assignment is related to the development of flood protection structures based upon the Act of 8 July on the special preparation rules for flood protection investments, and therefore in accordance with Article 82 (2) of the *EIA Act* it is not necessary to identify the compliance of its implementation with the valid LSDP.

Variant analysis for the planned investment

- **Leaving the present condition**

Due to necessary maintenance of continuity for the flood protection for Cracow, including e.g. Płaszów housing estate, Rybitwy housing estate, it is not considered to remove the embankments or leave them in the present condition. A potential removal of the embankments would result in flooding of a huge area of the city at each bigger flood. Leaving the present condition would cause a huge disproportion in flood safety between the protected areas of the city, and also reduction of protection for areas with raised embankments, which directly adjoin the embankments covered by this investment, which would be caused by a possibility of spilling water over the embankments in question and by flooding of the areas protected by higher, already redeveloped embankments.

- **Location option**

As we refer to the existing embankments, it was not justified to look for new locations for their route. They currently correspond with the landscape, and the neighboring inhabitants got used to them. In order to minimize a risk of conflicts the extension is directed towards the embanked area, which contains much less development.

- **Options of typical section**

An option of redevelopment and extension assumed for investments of that kind is the variant, where crest raising is obtained through extension of the existing embankment terrace. However,

its tightness shall be increased by embedding of bentonite mat into the new embankment body, and cement and bentonite membrane shall be developed in the subbase. Such an arrangement would allow for reduction of the vertical membrane (by the height of embankment, on which the mat is placed), thus it enables the application of bucket-ladder excavators and significantly reduces the development time (and therefore limits noise, dusting, and emission of combustion gas). The exception from that rule are locations of embankment objects – locks, where a bearing membrane in the form of bentonite or steel sheet piling shall be done; and collisions with facilities, which will be locally sealed with a membrane in the form of cement pressure injections. In case of the planned investment it was considered to raise the embankment with a reinforced-concrete wall. An essential advantage of that solution is limitation of the area necessary for embankment raising, as it practically is equal to the area necessary for embankment crest's extension (in case of filling with soil, 1 m of raising generated acquisition of a land strip over a width of 4.5 m along the embankment). However, that solution has numerous defects, which resulted in the absence of its consideration for the embankment section in question. The basic defect of that solution is generation of permanent and difficult obstacle over the entire application length. Easy passing through the embankment is feasible only at embankment crossings. It generates use difficulties, including necessary assembly of portable flood protection barriers at those crossings in a short time, which would require a relevant number of workers and equipment for transportation of barriers. Furthermore, it is important that it would be an alien element in the landscape, as the most of the embankment route joins green areas and not development, as in case of Cracow.

It was also considered to seal the embankment body using a concrete membrane with cement leaven (mixed with soil) done in the embankment axis. Such a location causes that it is longer than the embankment's height, and the performance technology (spot soil mixing using an auger) makes it very time- and labour-consuming. Furthermore, a tight vertical membrane in the embankment axis distinctly separates it in terms of water and soil conditions. Vegetation growing on the landside (area beyond the embankment) faces more difficult development conditions due to lower humidity at that part of the embankment body.

Finally, the planned redevelopment and extension of the embankments contains sealing of the embankment body according to four typical sections.

Basic type I of typical section includes extension of the embankment body on the embanked area's side (riverside), crest shall be hardened using gravel mix on geo-textile and breakstone, service roads shall be developed at the buttress or at the landside embankment foot (locally the road may move away from the embankment slope's basis to e.g. bypass and protect objects or habitats located within the embankment route), hardened with sand ballast on geo-textile, breakstone and voussoir for the purpose of service crossings. Section of that type shall be implemented in case of the most of the embankment sections to be redeveloped.

However, in locations where it is not possible to develop a service road at the buttress or at the slope basis (e.g. due to the lack of space for the buttress or fenced premises in a direct vicinity of the embankment colliding with the route) it is planned to apply **the so-called type II of typical section**, which differs from type I with placement of the service road on the embankment crest and with the absence of a buttress.

Furthermore, in location, where – due to environmental and conservatory reasons or the lack of space – it is not possible to perform redevelopment according to type I and II sections, **type III of typical sections was implemented**, which contains development of a membrane from the

embankment crest, but using the same technology as in case of membrane arranged in the subbase for type I and II sections. Sections at chainage km 0+974 and km 9+105 present descend roads.

Additional **type IV** for extension of the embankment was implemented for section located between km 7+420 and km 7+495, and it results from completion – during the designing – of an investment associated with construction of S7 route between the Biezanów junction and Igołomska Street. In a reach where type IV of embankment extension was applied, the bottom of a road bridge is placed about 4.5 m above the crest of existing embankment. Within the framework of bridge development works associated with protection of the existing embankment with gabion mattresses were done, and in the axis of the embankment a membrane – made of sheet piles – was driven into a depth of 15 m from the embankment crest. Due to necessary maintenance of project's durability for the works performed in the scope of GDDKiA investment, and necessary maintenance of vertical gauge between the bridge bottom and the embankment, type IV of extension was implemented, and it includes leaving the embankment crest at the existing elevation, with obtainment of the required elevation using a concrete wall with stone cladding. The solution is similar to the ones applied at modernization of embankments in the area of Wawel.

Considering the above it shall be stated that the method selected (four types) to seal the embankment body is the most favorable one for the environment.

For each type of cross-sections the following slope inclination was adopted – as a rule confirmed by static calculations:

- Riverside slope – 1:2.5;
- Landside slope – 1:2.

In exceptional cases the slopes may be even shaped to a value of 1:0.5 in order to limit the acquisition of protected land or the collision with buildings or structures.

Sub-items of item 2: a, b, c, d, f, g, h, i, j, k, l – included within contents of justification to the decision of the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.3.2016.BM – remain unchanged.

5. Item 2 e. *“Location of the investment, including possible hazard to the environment, and especially at the existing and planned land use, self-purification possibilities for the environment and renewal of natural resources, environmental and landscape values and local conditions under spatial management plans.”*

e) *“Areas requiring special protection due to the presence of plant, animal, and fungi species or their habitats or natural habitats under protection, including Natura 2000 sites and other forms of environmental protection.”*

gains the following new meaning:

Implementation and operations of the planned investment shall not adversely affect legally protected areas established based upon the Act of 16 April 2004 on the conservation of nature. The analyzed investment is located beyond the boundaries of European Ecological Network Natura 2000. The closest site – Łąki Nowohuckie PLH120069 – is located in a distance of about 1.6 km north from the closest boundary of the investment site. The area is placed within the Vistula valley (in the

former flood terrace). On the south it borders the Vistula's oxbow lake, on the north with the center of Nowa Huta – precinct of Cracow. Łąki Nowohuckie is the last well-kept part of meadows at Vistula in Nowa Huta. One can find over 10 diversified plant groups within a small area. The main objective of protection within the aforementioned area is the protection of meadow habitats (moor-grass meadows and oat-grass meadows) as habitats of butterflies remaining the main subject of protection. There is no adverse impact of the investment on subject of Natura 2000 site protection.

The biggest impact of the investment on the environment shall be seen on implementation stage. Due to the works and machines applied the following emission shall occur: gas and dust to the air, noise, waste; those shall however be short-term and reversible nuisances. Acoustic nuisance associated with the development time shall stop at the completion of works.

The planned earthworks in the area of valuable habitats present on parts of riparian patches in the area of Cracow (codes 91E0 and 91F0) shall be maximally limited. The investment is partially located at edges of habitats and covers a small area in comparison to the entire habitat. Materials shall be delivered to the construction site using public roads, and temporary roads shall be developed beyond the aforementioned areas of valuable habitats.

The analysis done for the environmental inventory completed for the task proves that at the bank of Vistula, on site grown with trees and shrubs. However, the biggest number of fresh beaver traces was noted at the Łęg Thermal-Electric Power Plant and at the Wandy Bridge. In spring, based upon fresh traces of beaver teeth on trees, their presence was also confirmed in case of Vistula oxbow lake's meanders in the area of Przewóz Barrage. The habitat is partially located within the boundaries of the area designated for the investment. Traces of damage caused by beavers was not noted on the embankments. The designed land acquisition boundaries for the planned construction works run in a distance of max. 5 m from the embankment foot. During the construction works an adverse impact – i.e. scaring and disturbance of beavers – shall be exerted in case of specimens inhabiting Vistula oxbow lake's meanders located at the Przewóz Barrage. That habitat is located within the analyzed area and in a distance of about 15 m from the place of planned works. As a consequence, it shall be necessary to obtain a decision of the Regional Director for Environmental protection in Cracow allowing for deviation in case of protected animal species. During the construction works an adverse impact – i.e. scaring and disturbance of beavers – shall be exerted in case of specimens inhabiting spots grown with trees and shrubs in vicinity of the embankments and within the embanked area. After completion of the works the adverse impact shall stop.

Based upon the site tests within the discussed section of Vistula embankments presence of partially protected species – common centaury (*Centaurea merythraea*) – was identified. It is a rare species within the area of tests, it is present only within few stands, mainly within fallows in the middle and in the southern parts of the right Vistula embankment.

The Vistula oxbow lake (area of the Przewóz Barrage) located within the final section of the investment is a spot, where many natural habitats occur, including the area of beaver (*Castor fiber*) presence. That oxbow lake is located beyond the direct impact of the investment and shall not be damaged.

Necessary logging of trees and shrubs is planned under the investment. The logging shall be limited only to trees and shrubs growing just at the spot of redevelopment and extension, and trees growing in the direct vicinity of the works shall be protected against damaging.

In order to minimize nuisance associated with implementation of the subject task, the Investor obliged itself to apply the following solutions protecting the environment:

- Any work during implementation of the investment shall be performed under constant supervision of the environmental team,
- It is forbidden to undertake any actions to dry the Vistula's oxbow lake in vicinity of Brzegi, what may adversely affect diverse humidity and humid habitats formed in that area,
- Works shall not be done where valuable environmental habitats occur – riparian forests (91E0, 91F0). Those patches are usually located in a distance from flood embankments, but one shall take care in planning the works, to avoid damaging, e.g. during deliveries of construction material to the construction site. It is forbidden to set the technological roads out through or in a direct vicinity of that habitat. In case of a small distance any work associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- In case of a habitat with oak-elm-ash riparian forest (91F0) at chainage km 0+250 to 0+350 of the Vistula embankment in section 2, the riparian forest grown on both sides of the embankment. In that case any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment. One is not allowed to set the technological roads out or located temporary backyard facilities within that habitat. Any work shall be done with high care to avoid damaging of the surrounding riparian tree-stand.
- It is forbidden to perform works, take natural materials, as well as set the technological roads out in the area of habitat of hay meadows (6510). Any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- As a result of identifying a stand of very valuable species of hermit beetle, which is located in old, rotting willows growing at the embankment on the embanked area's side, the works at redevelopment of the embankments in that section were designed to avoid threatening to the existing stand. Relocation of the embankment shall assure the protection of the trees as well as their root system. A technological road shall be placed on the opposite side, i.e. in the area beyond the embankment. Prior to the commencement of works it was expected to protect the trees additionally against damaging and covering using protection made of straw mats and wooden fences. All of the protection works shall be supervised by an environmentalist.
- Any work shall be done to avoid drying of water pits, Vistula oxbow lakes,
- Any locations of back-up facilities shall be placed beyond the area of valuable environmental habitats, and also beyond areas of medium and high ornithological value, and beyond habitats of amphibians and beavers,
- The Contractor for the investment is obliged to inspect vehicles and construction machines in terms of technical efficiency. In case of machine failure any leakage of operating fluid and fuel shall be neutralized with relevant amount of absorbent stored at every back-up facility.
- Tree trunks located within the work site or in its direct vicinity under risk of mechanical damaging shall be protected against damaging at height not smaller than 1.5 m from the ground level, and materials shall not be stored and new delivery routes shall not be set out in a distance of 1 m from trunks of trees and shrubs.
- The area of back-up facilities, where machines and trucks would operate, shall be protected. Parts of back-up facilities, tightly insulated from the ground, shall be designated for servicing and fueling of the machines.
- Waste produced during implementation of the investment shall be segregated and selectively stored in containers or in separated sites adapted to that purpose, in conditions preventing

dusting and blowing light fractions away, and preventing adverse impact on the environment; they should be consecutively taken over by units certified for their further treatment.

- Logging shall be done only beyond the hatching period for birds, i.e. from the beginning of October to the end of February. In case it would be necessary to perform an additional logging within the hatching period, the works may be done only under supervision of an ornithologist.
- Any work performed in vicinity of hatching habitats of amphibians – identified on an ongoing basis by the environmental supervisor – may be performed only at application of herpetological fencing protecting the construction site against migration of amphibians. In case of identifying specimens of amphibians, they will be caught on an ongoing basis and relocated to substitute habitats existing in a safe distance. A list of those habitats shall be developed for an application on the issuance of derogation for measures forbidden in reference to protected species.

Prior to the commencement of spring migration of amphibians the construction site in the area of culverts, ditches and water-courses shall be surrounded with a temporary herpetological fencing. During the migration the amphibians gathering at the fencing shall be caught and relocated to a relevant habitat, i.e. in spring from the embanked area to a flowage in the area beyond the embankment, and in autumn – the other way round. After completion of the works the temporary fencing shall be removed.

In case of the works in occurrence locations from March to October, adult specimens of amphibians, their eggs (spawn) and larvae (tadpoles) shall be caught and relocated based upon a decision of the RDOŚ in Cracow on the deviation from bans related to the protected species of amphibians. Potential covering of habitats shall be done in autumn and in winter (November – February).

Considering the: character, location of the investment and planned mitigation measures, it was identified that its implementation shall not significantly and adversely affect the protected items of the closest Natura 2000 site Łąki Nowohuckie PLH120069 and the cohesion of the European Ecological Network Natura 2000.

III. The remaining contents of the decision on environmental conditions, as issued by the Regional Director for Environmental protection, dated 01/27/2017, ref. no.: OO.4233.3.3016.BM, **remain unchanged.**

V. Based upon the Investor's Proxy decision filed in writing on 01/03/2019, ref. no.: PK/OI/15007/14/2019, **I make the modified decision immediately enforceable.**

Justification

The State Water Holding Polish Waters Regional Water Management Authority in Cracow, 22. Marszałka J. Piłsudskiego Street, 31-109 Cracow, represented by Mr. Radosław Radoń – Manager of the Odra-Vistula Flood Management Project Implementation Office at the Regional Water management Authority in Cracow, applied on 05/07/2018 (reception date: 05/10/2018), ref. no.: KR.JRP.081.8.11.2018 to the local authorities ***for modification of the decision on environmental conditions, as issued by the Regional Director for Environmental Protection on 01/27/2017, ref. no.: OO.4233.3.2016.BM, for the investment titled: "Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 3 - the right embankment of the Vistula from the Dąbie barrage to the Przewóz barrage"***, as results from provision of details and from

establishments made on design solutions for the subject investment, for which the decision of the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.3.2016.BM, was issued.

In the course of proceedings the application was supplemented with formal parts with notes: dated 06/06/2018 (reception date: 06/07/2018), ref. no.: KR.JRP.081.8.11.2018; dated 06/27/2018 (reception date: 06/27/2018), ref. no.: KR.JRP.081.8.11.2018; dated 07/05/2018 (reception date: 07/06/2018), ref. no.: KR.JRP.081.8.11.2018; and dated 07/13/2018 (reception date: 07/16/2018), ref. no.: HTK/AD/15007/1310/18; and supplemented with substantial parts with notes: dated 10/05/2018 (reception date: 09/17/2018), ref. no.: HTK/AD/15007/1755/18; dated 11/09/2018 (reception date: 11/09/2018), ref. no.: HTK/AD/15007/1933/18; and dated 12/07/2018 (reception date: 12/20/2018), ref. no.: HTK/AD/15008/2067/18; updated with clarifications submitted by e-mail on 12/20/2018 (those clarifications have been directly submitted by the Proxy to the Ministry of Navigation and Maritime Affairs).

On 06/27/2018 the Investor's representative, i.e. Mr. Radosław Radoń, informed the local authorities that a Proxy acting on behalf of the Investor shall be Mr. Dariusz Adamek of SWECO Engineering Sp. z o.o., 30. Wielicka Street, 30-552 Cracow. Subsequently, from 09/03/2018 Mr. Piotr Kutynski of SWECO Engineering Sp. z o.o., 30. Wielicka Street, 30-552 Cracow, was assigned as the Investor's Proxy. The power of attorney for Mr. Dariusz Adamek was therefore withdrawn.

Required documents – as listed under Article 74 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments (OJ of 2018, item 2081, as amended) – have also been filed, and they remain appendices to the application.

The subject investment task is qualified to group II of investments, which may potentially significantly affect the environment, for which it may be required to implement an environmental impact assessment, in accordance with **Article 3 (1) item 65** – *“flood defenses, except for redevelopment of flood embankments including sealing of the embankment body and its subbase, to limit the possibility of washing-out and failure during accommodation of flood water, as well as regulation of water or its channeling understood as water management allowing for its use for navigation purposes”*, and with **Article 3 (1) item 60** – *“roads with hardened course with a total investment length of over 1 km, other than ones listed under Article 2 (1) items 31 and 32, and bridge objects in an artery of a road having hardened course, except for redevelopment of roads and bridge objects used for servicing of power stations, and located beyond areas under environmental protection, as discussed under Article 6 (1) items 1-5, 8, and 9 of the Act of 16 April 2004 on conservation of nature”* – of regulation of the Council of Ministers of 9 November 2010 on the investments which may significantly affect the environment (OJ of 2016, item 71, consolidated text).

The applied modification of the decision on environmental conditions for the aforementioned investment, in accordance with the investor proxy's application, shall be necessary to obtain a decision on investment project implementation permit, as discussed under provisions of the Act of 8 July 2010 on the special preparation rules for flood protection investments; thus – in compliance with Article 75 (1) item 1 letter i) of the *EIA Act* – the unit relevant for the issuance of decisions on environmental conditions is the Regional Director for Environmental Protection in Cracow.

In conformity with provisions under Article 155 of the Administrative Procedure Code, in reference to Article 75 (1) item 1 letter p) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments, the unit relevant for the issuance of modified decision on environmental conditions, for the issuance of which the Regional Director for Environmental Protection was the relevant unit, shall also be the Regional Director for Environmental Protection.

In accordance with Article 87 of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments, in case of modifying the decision on environmental conditions, provisions under Section V shall be respectively applied.

Formally complete documentation allowed for commencing proceedings by the Regional Director for Environmental Protection in Cracow on modification of the aforementioned decision on environmental conditions. The Regional Director for Environmental Protection in Cracow informed the parties in notification dated 07/25/2018, ref. no.: OO.420.4.1.2018.BM, about commencement of the proceedings and about a possibility of acknowledging with the case documents.

The subject notification dated 07/25/2018, ref. no.: OO.420.4.1.2018.BM, was successfully placed on the noticeboard of the Regional Directorate for Environmental Protection, as well as on the noticeboards of the City Office of Cracow and of the City and Commune Office of Wieliczka. Furthermore, information on the commencement of proceedings was included in the Public Information Bulletin at the website of the Regional Directorate for Environmental Protection in Cracow, and also in the publicly accessible data register at the website of the Center on Information on the Environment.

The list of proceeding parties for the aforementioned investment was adopted in accordance with the boundaries of implementation area and if investment impact range, in the scope of its modification. Based upon the provided site plan and extracts from the land register it was established that the number of proceeding parties exceeded 20. As a consequence, in accordance with Article 74 (3) of the Law of 3 October 2008 on access to information on the environment and its protection, public participation in environmental protection and environmental impact assessments, Article 49 of the Administrative Proceeding Code – stating notification of the parties through a public announcement – was applied.

After two substantial updates of the investment data sheet, the Regional Director for Environmental Protection in Cracow applied in the note dated 11/13/2018, ref. no.: OO. 420.4.1.2018.BM, to the State District Sanitary Inspector in Cracow and to the Ministry of Maritime Affairs and Inland Navigation in Warsaw for opinions on an obligation to provide an environmental impact assessment for the investment in question and for potential establishment of the range of report. Information on application for opinions has been placed on the noticeboard of the Regional Directorate for Environmental Protection in Cracow, as well as in the Public Information Bulletin at the website of the Regional Directorate for Environmental Protection in Cracow.

The Regional Director for Environmental Protection in Cracow has also informed the proceeding parties about a change of the Proxy. From 09/03/2018 a new proxy representing the Investor is Mr. Piotr Kutyrński of Sweco Engineering Sp. z o.o.

The Minister of Maritime Affairs and Inland Navigation – after previous call for update of the investment data sheet (dated 11/27/2018, ref. no.: DOK.DOK2.9750.13.2018.SW) – issued through the RDOŚ in Cracow (note dated 12/07/2018, ref. no.: OO.420.4.1.2018.BM) and after direct

submission of clarification by e-mail by the Proxy an opinion dated 12/21/2018 (reception date: 12/21/2018), ref. no.: DOK.DOK2.9750.13.2018.SW, confirming that it is not necessary to provide an environmental impact assessment.

The State District Sanitary Inspector in Cracow informed its standpoint in the note dated 11/27/2018 (reception date: 12/29/2018), ref. no.: NZ-PG-420-340/18 ZL/2018/11/357, and stated that it is not necessary to provide an environmental impact assessment.

The Regional Director for Environmental Protection in Cracow issued the decision on environmental conditions dated 01/27/2017, ref. no.: OO.4233.3.2016.BM, for the investment titled **“Completion of the rehabilitation of the flood embankments of the Vistula River in Kraków: Section 3 - the right embankment of the Vistula from the Dąbie barrage to the Przewóz barrage”**.

Due to provision of details and to establishments made on design solutions for the subject investment, the Investor applied for modification of the aforementioned decision on environmental conditions. The subject of modification is related to the following:

- *Modification of chainage provided, including division of the investment into tasks;*
- *Implementation of additional data on the area of properties or their parts, which would remain a part of the investment, and are necessary for its implementation, and which become properties of the State Treasury;*
- *Modification of chainage for deposits;*
- *Implementation of additional IV type of typical section and of provision on the possible shaping of the embankment slope to the value of 1:0.5;*
- *Modification of chainage provided for particular types of typical embankment sections;*
- *Modification of provisions related to descend roads and embankment crossings in the scope of names of works, as result from the construction law and from the description of descend roads' courses, as agreed with ZIKiT;*
- *Implementation of information associated with the location of maneuvering sites;*
- *Implementation of corrective information on redevelopment and demolition of the existing culverts;*
- *Implementation of information correcting chainage of membranes in the embankments' bodies;*
- *Modification of provisions in the decision in reference to protected areas.*

The remaining design solutions for the embankment to be redeveloped: *Section 3 - the right embankment of the Vistula from the Dąbie barrage to the Przewóz barrage*, as informed under the environmental decision issued by the Regional Director for Environmental Protection in Cracow on 01/27/2017, ref. no.: OO.4233.3.2016.BM, remain unchanged.

Changes to the aforementioned environmental decision, as applied by the Investor, are presented in details below:

- A summary of division of the investment into tasks (chainage of the embankments covered by the decision, with corresponding working chainage) shall be modified, as results from the necessary provision of details for the investment scope, excluding sections, where breaks in the embankments occur for embankment bodies at access roads to bridges in arteries of Nowohucka Street and Półnaki Street.

Planned investment	Register chainage km		Working km
	Embankment km	Respective river km	Embankment km

3.1	81+193	81+256	0+000
	82+127	82+909	0+934
3.2	82+149	82+931	0+956
	87+081	87+899	5+888
3.3 within the Municipality of Cracow	87+095	87+913	5+902
	90+519	92+150	9+326
3.3 within the Commune of Wieliczka	90+519	92+150	9+326
	91+850	92+800	10+678

- The planned area determined in the application is modified and it currently amounts to about 115 ha. However, the area of properties or their parts remaining a part of the investment, and necessary for its implementation, which become properties of the State Treasury or a unit of local authorities is about 26 ha. The implemented modification of the area under the application results from indication of the impact range for deposit no. 1, which underwent an environmental inventory and was included in the original application on the issuance of decision on environmental conditions. The investment impact range shall not be modified as new plots have not been implemented.

- Chainage of location for particular deposits and areas of deposits no. 4, 6, and Brzegi were modified.

It was originally planned to take the soil for construction of the embankments from deposits present in the following locations:

- a) Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area – area of 3.94 ha;
- b) Deposit no. 2 – chainage of the Vistula River about km 89+500, left bank, embanked area – area of 5.59 ha;
- c) Deposit no. 3 – chainage of the Vistula River about km 86+000, right bank, embanked area – area of 2.53 ha;
- d) Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area – area of 2.01 ha;
- e) Deposit no. 5 – chainage of the Vistula River about km 91+200 right bank, embanked area – area of 1.24 ha;
- f) Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area – area of 1.18 ha;
- g) Deposit no. 7 – chainage of the Vistula River about km 85+500, right bank, embanked area – area of 1.68 ha;
- h) Deposit Brzegi, area of 3.09 ha – purchase of materials from KZEK Kraków.

However, after performing geological tests of deposits' utility for the intake of soil and after establishments made with land owners, the following deposits were left only:

- a) Deposit no. 1 – chainage of the Vistula River about km 82+500, right bank, embanked area. Due to the significant amount of waste materials deposited in the past that deposit may be used in a small part only for the intake of non-cohesive soil above the table of ground water.
- b) Deposit no. 4 – chainage of the Vistula River about km 88+900, left bank, embanked area. The deposit is made of up to 3.0 m deep layer of cohesive soil (loam and loamy sand) placed on non-cohesive soil (medium sand, dusty sand). The level of ground water is about 3.3 m below the ground level. The expected use of up to 3.0 m deep below the level of ground.
- c) Deposit no. 6 – chainage of the Vistula River about km 93+700, left bank, embanked area. The deposit is made of up to 1.6 m deep layer of cohesive soil (sandy dust) placed on non-cohesive soil (fine sand). The level of ground water is about 5.7 m below the ground level. The expected use of up to 3.0 m, including cohesive soil and non-cohesive soil.
- d) Deposit– Brzegi. The area of aggregate extraction by the Krakowskie Zakłady Eksploatacji Kruszyw. In case of layers located at surface layers soil placed in that deposit is waste (KZEK extracts non-cohesive soil and sorts it) for the extraction plant, but it would be a valuable material for the construction of a static body of the embankments. That soil shall be bought from KZEK and delivered to the embedding location. Due to the need for soil in the amount of about 300 K m³, the most of materials to be embedded shall be taken from the deposit in Brzegi.

- Implementation of additional IV type of typical section and the possible shaping of the embankment slope to the value of 1:0.5 in exceptional cases. Finally, in case of the planned redevelopment and extension of the embankments it is planned to seal the bodies of embankments according to four types of section. Information related to section types I, II, and III, which have been presented in the aforementioned environmental decision, are still binding.

Additional type IV for extension of the embankment was implemented for section located between km 7+420 and km 7+495, and it results from completion – during the designing – of an investment associated with construction of S7 route between the Biezanów junction and Igołomska Street. In a reach where type IV of embankment extension was applied, the bottom of a road bridge is placed about 4.5 m above the crest of existing embankment. Within the framework of bridge development works associated with protection of the existing embankment with gabion mattresses were done, and in the axis of the embankment a membrane – made of sheet piles – was driven into a depth of 15 m from the embankment crest. Due to necessary maintenance of project's durability for the works performed in the scope of GDDKiA investment, and necessary maintenance of vertical gauge between the bridge bottom and the embankment, type IV of extension was implemented, and it includes leaving the embankment crest at the existing elevation, with obtainment of the required elevation using a concrete wall with stone cladding. The solution is similar to the ones applied at modernization of embankments in the area of Wawel.

For each type of cross-sections the following slope inclination was adopted – as a rule confirmed by static calculations: riverside slope – 1:2.5; landside slope – 1:2. In exceptional cases the slopes may be even shaped to a value of 1:0.5 in order to limit the acquisition of protected land or the collision with buildings or structures.

- Information on types of sections applied within analyzed sections of the redeveloped embankment, as results from implementation of additional type IV cross section and from correction of descend roads in section 3.3 of the embankment, is modified.

Type of applied section	Starting chainage	Ending chainage
SECTION 3.1 (from the Dąbie Barrage to Nowohucka Street)		
TYPE II	0+000	0+029
TYPE I	0+029	0+909
TYPE II	0+909	0+934
SECTION 3.2 (from Nowohucka Street to Półhanki Street)		
TYPE II	0+956	0+977
TYPE I	0+977	1+222
TYPE II	1+222	1+297
TYPE I	1+297	2+920
TYPE II	2+920	2+960
TYPE III	2+960	3+144
TYPE II	3+144	3+420
TYPE I	3+420	4+645
TYPE II	4+645	5+546
TYPE I	4+773	4+645
TYPE II	5+546	5+682
TYPE I	5+682	5+871
TYPE II	5+871	5+888
SECTION 3.3 (from Półhanki Street to the Przewóz Barrage)		
TYPE II	5+902	5+920
TYPE I	5+920	6+390
TYPE II	6+390	7+420
TYPE IV	7+420	7+495
TYPE II	7+495	7+747
TYPE I	7+747	8+911
TYPE II	8+911	9+156
TYPE I	9+156	9+686
TYPE II	9+686	10+213
TYPE I	10+213	10+591
TYPE II	10+591	10+678

- Modification of names related to descend roads and embankment crossings in the scope of names of works, as result from the construction law and from the description of descend roads' courses, as agreed with ZIKiT, and as results from implementation of the embankment's register chainage. Changes in the table do not cause modification of the scope of works to be done, as well as objects listed under the original decision.

Reinforced-concrete openwork road slabs were applied for embankment crossings and descend roads, and in case of asphalt roads administered by ZIKiT in Cracow or by ZDP in Wieliczka – asphalt concrete. Their application is necessary to protect the embankment crest against excessive passing over. The application of open-work slabs shall allow for simultaneous maintenance of the surface as partially permeable.

In order to limit the area acquired by embankments of embankment crossings and descend roads – as those often are arable fields – the grade of slopes beyond the embankment was increased to 1:1.5 and within the embanked area to 1:2.

Tabulated summary of location of the existing and of new descend roads and crossings.

Descend road no.	Embankment working km	Embankment register km	Existing/new descend road	Description
1	0+010	81+203	existing / redeveloped	Embankment crossing – junction with a road, plot of State Treasury (Na Zakolu Wisły Street)
2	0+030	81+223	New	Exit from service road – junction with a road, private plot (Na Zakolu Wisły Street)
3	0+515	81+708	existing / redeveloped	Embankment crossings
4	0+800	81+993	New	Descend road from the crest to a private plot
5	0+934	82+127	new	Descend road – junction of a pedestrian and bicycle path with a pavement (Nowohucka Street), plot of State Treasury
6	0+934	82+127	existing / redeveloped	Descend road – junction of the road on shelf with a pavement (Nowohucka Street), plot of State Treasury
7	0+956	82+149	New	Descend road – junction of a pedestrian and bicycle path with a pavement (Nowohucka Street), plot of State Treasury
8	0+974	82+167	existing / redeveloped	Embankment crossing
9	0+977	82+170	New	Descend road from the crest to a road on shelf
10	1+221	82+414	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of State Treasury
11	1+222	82+415	New	Descend road from the crest to a road on shelf
12	1+254	82+447	existing / redeveloped	Descend road from the crest to a private plot
13	1+300	82+493	New	Descend road from the road on shelf to a private plot
14	1+316	82+509	New	Descend road from the crest to a private plot
15	2+046	83+239	Existing – to be removed	Embankment crossing
16	2+119	83+312	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the Municipality of Cracow
17	2+670	83+863	existing / redeveloped	Embankment crossing – junction with the road, plot of the

				Municipality of Cracow (Golikówka Street)
18	2+920	84+113	New	Descend road from the road on shelf, plot of the Municipality of Cracow
19	2+944	84+137	New	Descend road from the crest to a road
20	3+128	84+321	New	Descend road from the crest – junction with a road, plot of the Municipality of Cracow (Golikówka Street)
21	3+388	84+581	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Golikówka Street)
22	3+420	84+613	New	Descend road from the road on shelf – junction with the road, plot of the Municipality of Cracow (Golikówka Street)
23	3+722	84+915	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow
24	3+923	85+116	existing / redeveloped	Embankment crossing – junction with the dirt road, private plot
25	4+266	85+459	existing / redeveloped	Embankment crossing – junction with the dirt road, private plot
26	4+395	85+588	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Golikówka Street)
27	4+690	85+883	New	Descend road from the crest to a road on shelf
28	4+720	85+913	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the Municipality of Cracow
29	4+732	85+925	New	Descend road from the crest to a road on shelf
30	5+586	86+779	New	Descend road from the crest to a road on shelf
31	5+644	86+837	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Szparagowa Street)
32	5+648	86+841	New	Descend road from the crest to a road on shelf
33	5+871	87-064	New	Descend road from the road on shelf – junction with the dirt road, plot of the Municipality of Cracow
34	5+888	87+081	New	Descend road – junction of the pedestrian and bicycle path with the pavement (Półhanki Street),

				plot of the Municipality of Cracow
35	5+902	87+095	New	Descend road – junction of the pedestrian and bicycle path with the pavement (Półnaki Street), plot of the Municipality of Cracow
36	5+920	87+113	New	Descend road from the road on shelf – junction with the dirt road, plot of the Municipality of Cracow
37	6+382	87+575	New	Descend road from the road on shelf to a private plot
38	6+432	87+625	New	Descend road from the crest to a road on shelf
39	6+445	87+638	New	Descend road from the crest to a private plot
40	7+058	88-251	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow (Pod Wierzbami Street)
41	7+205	88+398	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the State Treasury
42	7+643	88+836	existing / redeveloped	Embankment crossing – junction with the dirt road, plot of the State Treasury (Bugaj Street)
43	7+697	88+890	New	Descend road from the crest to a road on shelf
44	8+673	89+866	existing / redeveloped	Embankment crossing – junction with the road, plot of the Municipality of Cracow
45	8+957	90+150	New	Descend road from the crest to a road on shelf
46	9+105	90+298	existing / redeveloped	Embankment crossing
47	9+111	90+304	New	Descend road from the crest to a road on shelf
48	9+721	90+914	New	Descend road from the crest to a road on shelf
49	9+724	90+917	existing / redeveloped	Embankment crossing – junction with the road (Łutnia Street)
50	10+210	91+403	existing / redeveloped	Embankment crossing – junction with the road (Łutnia Street)
51	10+213	91+406	New	Descend road from the crest to a road on shelf
52	10+631	91+824	New	Descend road from the crest to a road on shelf

- Implementation of information associated with the location of maneuvering sites.

Construction of service roads requires development of two maneuvering sites:

- Site no. 1 at chainage km 0+909 of the embankment (embankment's register chainage km 82+101) – a yard with dimensions of 12.5 x 12.5 m is located at the end of a service road

accessing Nowohucka Street. An exit from Nowohucka Street is closed with a barrier; thus, the maneuvering site allows for U-turn of vehicles without a necessity of obtaining consent for exit from the road administrator, i.e. ZIKiT, in case of everyday use and inspection of the embankments.

- Site no. 2 at chainage km 6+411 (embankment's register chainage km 87+604) – a yard with dimensions of 20 x 20 m is located at the culvert located at chainage km 6+442 (embankment's register chainage km 87+635), and it allows for provision of services and use of the culvert in case of flood event by the investor's staff and by fire brigade.

- Information on culverts (embankment locks) planned for redevelopment under the investment is modified. The investor resigned of redeveloping culvert P.3.3 and implemented information on culvert P.3.6, including a detailed description of works. Provided changes inform details for the scope of works only, including information associated with the detailed scope of works required by the provisions of the construction law. During making of the establishments the presence of a totally silted and unoperable culvert no. 3.6, which shall be demolished due to a risk of uncontrolled leaks and a lack of purpose for its existence within the developed area, was identified.

Tabulated summary of culverts (embankment locks) planned for redevelopment.

Culvert no.	Embankment km	Embankment register km	River km	Diameter [cm]	Remarks	Q1% [m ³ /s]	Designed diameter [cm]	Remarks
P.3.1	1+060	82+253	83+040	50x50	Object with reinforced-concrete abutments. Outlet reinforced with concrete slabs and grates, with a steel flap.	1.02	Ø100	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.2	2+637	83+830	84+430	52x50	Object with reinforced-concrete abutments. Bottom at the inlet reinforced with precasted concrete trench, outlet reinforced with concrete slabs and grates, with a steel flap	2.96	Ø110	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.3	3+095	84+288	84+728	55x50	-	0.002	-	Does not require redevelopment.
P.3.4	5+166	86+359	86+952	50x80	Object with reinforced-concrete abutments, bell-shaped section. Inlet and outlet reinforced with concrete slabs and	1.06	Ø90	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the

					grates, with a steel flap			bottom and of slopes. Assembly of a new return valve.
P.3.5	6+442	87+935	88+482	Ø80	Object with reinforced-concrete abutments. Outlet reinforced with concrete slabs and grates, with a steel flap.	0.74	-	Redevelopment of the culvert including its extension in the outlet section. Demolition of the existing abutment and construction of a new outlet abutment with a return valve. Development of revetments for the bottom and for slopes in inlet and outlet sections.
P.3.6	7+274	88+467	89+014		Totally silted culvert, with no opening for the abutments and for the hole itself.	-	-	Demolition of the culvert.
P.3.7	9+330	90+532	91+790	Ø90	Object with reinforced-concrete abutments, bell-shaped section. Outlet reinforced with concrete grates, outlet with a steel flap.	1.24	Ø100	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.
P.3.8	9+851	91+044	92+014	Ø60	Outlet reinforced with concrete slabs, with a steel flap and a reinforced-concrete abutment.	0.010	Ø100	Demolition of the culvert with abutments. Construction of a new culvert with greater diameter. Construction of inlet and outlet abutments, with protection of the bottom and of slopes. Assembly of a new return valve.

- Information correcting chainage of membranes in embankment bodies have been implemented. That change includes breaks in the membrane underneath road bodies and the already developed section of membrane underneath S7 route.

Membrane was designed for the following sections:

- **Section 3 right embankment of the River Vistula from km 0+007 to km 0+922**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 0+966 to km 2+925**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.

- **Section 3 right embankment of the River Vistula from km 2+925 to km 3+142** (Lasówka Fort), with a membrane developed from the embankment crest towards the subbase to a depth of 6 m. Embankment body sealed using the same technology as in case of the subbase.
- **Section 3 right embankment of the River Vistula from km 3+142 to km 5+878**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 5+910 to km 7+394**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.
- **Section 3 right embankment of the River Vistula from km 7+394 to km 7+506**, with a membrane developed within the embankment axis using sheet piles driven to a minimum depth of 6 m below the ground level.
- **Section 3 right embankment of the River Vistula from km 7+506 to km 10+678**, with a membrane developed at the riverside basis of the embankment towards the subbase to a depth of 6 m. Embankment body sealed on the riverside using bentonite mat or water-tight HDPE film.

- Information on protected areas was modified in reference to the occurrence of species under partial protection.

Based upon the site tests within the discussed section of Vistula embankments presence of partially protected species – common centaury (*Centaurea merythraea*) – was identified. It is a rare species within the area of tests, it is present only within few stands, mainly within fallows in the middle and in the southern parts of the right Vistula embankment.

The Vistula oxbow lake (area of the Przewóz Barrage) located within the final section of the investment is a spot, where many natural habitats occur, including the area of beaver (*Castor fiber*) presence. That oxbow lake is located beyond the direct impact of the investment and shall not be damaged.

Necessary logging of trees and shrubs is planned under the investment. The logging shall be limited only to trees and shrubs growing just at the spot of redevelopment and extension, and trees growing in the direct vicinity of the works shall be protected against damaging.

In order to minimize nuisance associated with implementation of the subject task, the Investor obliged itself to apply the following solutions protecting the environment:

The applied modification of the decision on environmental conditions would not change the adopted volume of pollution emission to the air in case of gas and dust substances, emission of pollution to water, and the volume of waste emission, as well as it would not change the volume of necessary water, raw materials, materials, fuel, and power. It is also not expected to change the applied solutions protecting the environment. Any assumptions remain coherent with the ones adopted on the stage of obtaining the decision on environmental conditions dated 01/27/2017, ref. no.: OO.4233.3.2016.BM.

Analysis of information provided in the valid IDS – in terms of conditions associated with qualification of the investment for development of an environmental impact assessment, as listed under Article 63 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments – allows for stating that the applied modifications, as listed above and as results from the provision of details and

from establishments made on design solutions for the subject investment, do not refer to modification of the investment locations in relation to water and mud areas and other areas with shallowly occurring ground water, shores, mountainous and forest areas, areas under protection, areas requiring special protection due to occurrence of plant species and animal species and their habitats, as well as natural habitats under protection – including Natura 2000 sites – where environmental quality standards have been exceeded, areas of direct protection for water intakes, areas of health-resort protection, and areas with landscape of historic, cultural or archaeological significance.

It shall be additionally emphasized that due to the type of investment, the impacts shall be of local reach, without a risk of transboundary impact. Due to the range of planned investment there is no possibility of impact accumulation, and application of natural resources, emission risk, occurrence of other nuisance, or occurrence of a serious industrial failure is minor. Implementation of the investment in question shall also not cause not reaching the environmental objectives included in the water management plan for the Vistula river-basin. All those and other required aspects determined under Article 63 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments have been analyzed in details on the stage of obtaining the decision of the Regional Director for Environmental Protection in Cracow dated 01/27/2017, ref. no.: OO.4233.3.2016.BM, and they are still binding.

The applied modification of the environmental decision does not implement new plots in terms of implementation and of investment impact.

In case of the subject investment it is not obligatory to provide an environmental impact assessment. An analysis of materials provided along with the application on the issuance of modified decision on environmental conditions for the investment in question proved that the majority of conditions determined under Article 63 (1) of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments shall not occur in case of the subject investment, and the remaining ones shall have a minor effect. As a consequence, it was stated that the planned investment shall not significantly affect the environment; thus, it is not necessary to provide the environmental impact assessment.

Considering the above, the Regional Director for Environmental Protection in Cracow, while taking into account opinions of units participating in the proceeding, stated in its resolution dated 01/03/2019, ref. no.: OO.420.4.1.2018.BM, that it is not obligatory to implement an environmental impact assessment for the investment in question. The parties could not claim against that resolution; however, they were able to claim as an appeal against this decision only. Information on the issued resolution was placed on the noticeboard of the RDOŚ in Cracow, included in the Public Information Bulletin at the website of the Regional Directorate for Environmental Protection in Cracow, and also in the publicly accessible data register at the website of the Center on Information on the Environment.

In the note dated 01/03/2019 (reception date: 01/03/2019), ref. no.: PK/OI/15007/13/2019, the Investor's Proxy applied for deviation from application of Article 10 (1) of the Act of 14 June 1960 Administrative Procedure Code (OJ of 2018, item 2096, as amended – hereinafter referred to as the APC). The application was reasoned by stating that *"quick issuance of the subject modification to the decision on environmental conditions is necessary for purposes of the investment in question, which is*

to protect the citizens of Cracow against the effects of floods. The investment – due to its character – is to protect health and life of people, and to protect national business against heavy losses – especially due to bad technical condition of the existing embankments – in the scope of the assignment under application (in case of the structure's technical assessment, as well as a shortage in embankment height) and very long time of use (over 100 years) without thorough, complex modernization of objects, which do not meet technical requirements of the regulation of the Minister of Environment of 20 April 2007 on technical conditions for hydraulic structures and their location. This results in numerous leaks and damages to the embankment noted during the flood of May 2010, which form a real threat to the inhabitants, as well as remain a serious risk for such industrial plants and service providers as e.g.:

- *Some technological facilities of the Sędzimir Smelter;*
- *Waste treatment plants in Kujawy and in Płaszów;*
- *Thermal Waste Processing Plant;*
- *Thermal-electric power station in Łęg (PGE Kraków);*
- *Industrial plants and service providers at Lipska Street, Jana Sarzyckiego Street, Rybitwy Street, and Christo Botewa Street.*

If in the previous years the modernized sections of embankments protected residential estates and the historic center of Cracow mainly, sections of the embankments planned for modernization under this investment are also to protect objects strategic for the city, which affect operations within the entire city.

Delays in implementation is that task also remain a realistic threat to the investment (flood protection objective), due to the funding method for the task in question (World Bank), which may cause the loss of funds and stoppage of the investment for the following years."

Considering the arguments stated above and the fact that the subject assignment is a "flood protection" investment, and lack of applications or remarks during the proceedings, notification of the parties in the mode under Article 10 (1) of the Act of 14 June 1960 Administrative Procedure Code (OJ of 2018, item 2096, as amended – hereinafter referred to as the APC) about completeness of the evidence and the possibility of commenting its contents was omitted. Therefore, in accordance with Article 10 (2) of the APC one has resigned of the rule determined under (1) of that Article, and did not provide the parties with a final notification on the collection of complete evidence, what would be associated with a potential possibility of final discussion of the parties on the collected materials and evidence.

Based upon an application of the Investor, acting through the Proxy – Mr. Piotr Kutyrński, dated 01/03/2019 (reception date: 01/03/2019), ref. no.: PK/OI/15007/14/2019, this decision has been made immediately enforceable based upon the mode under Article 108 (1) of the APC.

In accordance with Article 108 of the APC, in case of a decision against which one may appeal, immediate enforceability mode may be implemented, if it is necessary due to protection of health or life of people or for protection of the national business against heavy losses or due to other social interest or extremely overriding interest of the party.

While reasoning its application the Investor informed the overriding social interest, i.e. especially the protection of the citizens of Cracow against the effects of floods. It added that the area under risk of flooding is inhabited by 31 K people, and 3652 building are placed therein, including 3416 residential buildings and 236 industrial buildings within the area of 19.91 km². The investment – due to its character – is to protect health and life of people, and to protect national business against heavy losses – especially due to bad technical condition of the existing embankments – in the scope of the

assignment under application (in case of the structure's technical assessment, as well as a shortage in embankment height) and very long time of use (over 100 years) without thorough, complex modernization of objects, which do not meet technical requirements of the regulation of the Minister of Environment of 20 April 2007 on technical conditions for hydraulic structures and their location. This results in numerous leaks and damages to the embankment noted during the flood of May 2010, which form a real threat to the inhabitants, as well as remain a serious risk for industrial plants and service providers.

It also emphasized that a delay in implementation of that task also remains a realistic threat to the investment, due to the funding method for the task in question (World Bank), which may cause the loss of funds and stoppage of the investment for the following years.

Considering the arguments stated above, the request of the Investor's Proxy on making the decision immediately enforceable was accepted, as the arguments provided refer to the rationale indicated under Article 108 of the APC.

It shall furthermore be added that in accordance with a legal statement included in the sentence of SAC dated 21 June 1999 (IV SA 1425/97), making the decision – which is to e.g. remove an obstacle in implementation of planned investment assignments – immediately enforceable cannot be considered as a violation of law.

As an obligation to perform an environmental impact assessment for the investment was not imposed, it was not necessary to assure the possibility of public participation in the proceedings, in accordance with Article 79 of the Act of 3 October 2008 on access to information on the environment and its protection, public participation in environment protection and environmental impact assessments.

Analysis of the provided application and of information on the planned investment proves that the intended investment shall not cause nuisance to the environment exceeding the standards.

As a result it was decided as given in the conclusion.

Instruction

One may appeal against this decision to the General Director for Environmental Protection in Warsaw (00-922 Warsaw, 52/54. Wawelska Street) through the Regional Director for Environmental Protection in Cracow within 14 days from its serving date.

One may relinquish the right to appeal to the public administration unit, which issued the decision, in case of this decision. On the day the public administration unit received statements relinquishing the right to appeal by the last of the proceeding parties, the decision becomes final and binding.

Regional
Director for Environmental Protection
In Cracow
Rafał Rostecki MSc

Recipients:

1. Mr. Piotr Kutyrński – Investor's Proxy,
2. Remaining parties of the proceeding notified in the mode under Article 49 APC,
3. OO.BM file.

CC:

1. State District Sanitary Inspector in Cracow, 15. Gazowa Street, 31-060 Cracow (epuap),
2. Ministry of Maritime Affairs and Inland Navigation in Warsaw, 6/12. Nowy Świat Street (epuap).

Stamp charge in the amount of PLN 10.00 was paid for the issuance of this modification of the decision, in accordance with the Act of 16 April 2007 on stamp charge (i.e.: OJ of 2018, item no. 1044, as amended).

INFORMATION OF THE ADMINISTRATOR ON PERSONAL DATA PROCESSING

Due to enactment of the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 *on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC* (hereinafter referred to as GDPR) on 25 May 2018, we hereby inform that:

- 1) The Regional Director for Environmental Protection with its office in Cracow, 25. Mogilska Street, 31-542 Cracow, administers your personal data.
- 2) Your personal data shall be processed by the Regional Directorate for Environmental Protection for the purpose of administrative / court-administrative proceedings, in accordance with Article 6 (1) letter c) of the GDPR.
Provision of your personal data is voluntary, but necessary for fulfilling the legal obligation of addressing the case.
- 3) Your data may be provided by the Regional Director for Environmental Protection in Cracow to units authorized to obtain information based upon commonly valid provisions of the law.
- 4) Personal data provided by you shall be stored by the time required by provisions of the law.
- 5) You have a right to access your personal data and a right to adjust them, limit their processing, and a right to transfer the data.
- 6) Due to processing of your personal data you have a right to file a claim to the President of the Personal Data Protection Office.
- 7) Contact data to the Data Protection Inspector: e-mail address: iod.krakow@rdos.gov.pl, mail address: 25. Mogilska Street, 31-542 Cracow.

NEW CHARACTERISTICS OF THE INVESTMENT

The subject investment is located within the Municipality of Cracow and within the Commune of Wieliczka. The analyzed investment is located on the right bank of the River Vistula. Section of the embankment to be redeveloped overlaps the route of present embankments, crosses the body of Nowohucka Street, bypasses the Lasówka Fort, crosses Półnki Street, and reaches – with a wide arc – the Przewóz Barrage and the Vistula's oxbow lake, and ends at junction with embankments of the River Serafa. The boundaries between the Municipality of Cracow and the Commune of Wieliczka run through the embankment at chainage km 92+000 of the Vistula River (embankment chainage km 90+800 – working chainage km 9+326).

The analyzed embankment section starts at the Płaszów Port (downstream of the Dąbie Barrage), at the end of Na Zakolu Wisły Street. A dirt road is located on the embankment. "Zakole Wisły" garden allotments are located from km 0+100 to km 0+930 (working chainage of the embankment), in the area beyond the embankment. The embankment crosses Nowohucka Street at chainage km 0+945. The embankment protects houses and Małopolski Ośrodek Ruchu Drogowego [Małopolskie Traffic Center] from km 0+956 up to km 2+100, where garden allotments – reaching chainage km 2+600 – are located; the dirt road also continues its route there. Habitats of beavers are located within the embanked area between km 1+400 and 2+150. The embankment bypasses the Lasówka Fort – a historic object – in a reach from km 2+900 to 3+100. Numerous stands of beaver are located within the embanked area from km 4+000 up to km 7+000 (in sections: km 4+00 – 4+300, km 4+400 – 4+800, km 5+100 – 5+500, km 6+300 – 6+500, km 6+700 – 7+000). At chainage km 5+895 the embankment cross Półnki Street and turns into the Wandy Bridge, and at chainage km 7+450 the embankment crosses the construction site for S7 route. Habitats of beavers are located within the embanked area in a reach from km 9+000 to 10+678, mainly within the oxbow lake at the Przewóz Barrage. The embankment ends at km 10+678, just downstream of the Przewóz Barrage, in vicinity of the estuary of the River Serafa, and joins the embankments of that river.

A structure remaining a right abutment of the overpass holding heating pipes from the Łęg Thermal Power Station to receivers in the southern part of Cracow is located **in section 3** to be redeveloped between km 1+245 and km 1+345. Due to the placement of the structure in the embankment body, the modernization works shall not include any work, except for covering the area at the embankment with 0.2 m thick layer of ground, which results from the shortage of embankment height in that section. The structure shall not be redeveloped.

The planned area determined in the application is about 115 ha. The area of properties or their parts remaining a part of the investment, and necessary for its implementation, which become properties of the State Treasury or a unit of local authorities is about 26 ha.

The basic scope of works contains the works associated with redevelopment and extension of the embankments. Those shall mainly be the earthworks including e.g.:

- Removal of top top-soil layer from the slopes and from the embankment crest, and from the land strip adjacent to the embankment in order to prepare the site for extension (development of embankment);

- Profiling of uncovered slopes for the earth-fill embankment (so-called stair-shaping) and ploughing of the strip of land for the purpose of extension;
- Development of a membrane in the subbase;
- Development of an earth-fill embankment – extension;
- Placement of bentomat;
- Completion of the embankment – extension;
- Placement of a transition layer made of mineral soil;
- Placement of a top-soil layer with sowing using mix of grass.

The table given below summarizes chainage of the embankments under the investment, including corresponding working chainage.

Planned investment	Register chainage km		Working km
	Embankment km	Respective river km	Embankment km
3.1	81+193	81+256	0+000
	82+127	82+909	0+934
3.2	82+149	82+931	0+956
	87+081	87+899	5+888
3.3 within the Municipality of Cracow	87+095	87+913	5+902
	90+519	92+150	9+326
3.3 within the Commune of Wieliczka	90+519	92+150	9+326
	91+850	92+800	10+678

Scale of the planned rising for the flood embankments shall amount to:

Section of the modernized embankment divided into tasks	Highest [m]	Lowest [m]	Average [m]
3.1	0.42	0.08	0.25-0.35
3.2	0.95	0.00	0.40-0.5
3.3	0.85	0.00	0.55-0.7

In case of the designed embankment the minimum parameters were adopted as follows: crest width of about 4.0 m, grade of the riverside slope of 1:2.5 and of the landside slope of 1:2.0. The maximum height of the embankment shall rise to about 4.3 m. In exceptional cases the slopes may be shaped to a value of 1:0.5 in order to limit the acquisition of protected land or the collision with buildings or structures.

A structure remaining a right abutment of the overpass holding heating pipes from the Łęg Thermal Power Station to receivers in the southern part of Cracow is located in so-called section 3 to be

redeveloped between km 1+245 to km 1+345. Due to the placement of the structure in the embankment body, the modernization works shall not include any work, except for covering the area at the embankment with 0.2 m thick layer of ground, which results from the shortage of embankment height in that section. The structure shall not be redeveloped

A road runs along the riverside of the modernized embankment, between chainage km 0+010 and km 0+515, and remains a reinstatement of the existing dirt road. That road allows the owners of plots located within the Vistula's embanked area to access public roads. Modernization of the embankments in the range of raising their crest and of developing a membrane results in damages to that road. For purpose of keeping the existing conditions it shall be redeveloped after completion of the works along the embankment.

It is planned to seal the embankment bodies within the framework of the planned embankment modernization according to four types of sections.

Finally, the planned redevelopment and extension of the embankments contains sealing of the embankment body according to three typical sections.

Basic type I of typical section includes extension of the embankment body on the embanked area's side (riverside), crest shall be hardened using gravel mix on geo-textile and breakstone, service roads shall be developed at the buttress or at the landside embankment foot (locally the road may move away from the embankment slope's basis to e.g. bypass and protect objects or habitats located within the embankment route), hardened with sand ballast on geo-textile, breakstone and voussoir for the purpose of service crossings. Section of that type shall be implemented in case of the most of the embankment sections to be redeveloped.

However, in locations where it is not possible to develop a service road at the buttress or at the slope basis (e.g. due to the lack of space for the buttress or fenced premises in a direct vicinity of the embankment colliding with the route) it is planned to apply **the so-called type II of typical section**, which differs from type I with placement of the service road on the embankment crest and with the absence of a buttress.

Furthermore, in location, where – due to environmental and conservatory reasons or the lack of space – it is not possible to perform redevelopment according to type I and II sections, **type III of typical sections was implemented**, which contains development of a membrane from the embankment crest, but using the same technology as in case of membrane arranged in the subbase for type I and II sections.

Additional type IV for extension of the embankment was implemented for section located between km 7+420 and km 7+495, and it results from completion – during the designing – of an investment associated with construction of S7 route between the Bieżanów junction and Igołomska Street. In a reach where type IV of embankment extension was applied, the bottom of a road bridge is placed about 4.5 m above the crest of existing embankment. Within the framework of bridge development works associated with protection of the existing embankment with gabion mattresses were done, and in the axis of the embankment a membrane – made of sheet piles – was driven into a depth of 15 m from the embankment crest. Due to necessary maintenance of project's durability for the works performed in the scope of GDDKiA investment, and necessary maintenance of vertical gauge between the bridge bottom and the embankment, type IV of extension was implemented, and it includes leaving the embankment crest at the existing elevation, with obtainment of the required

elevation using a concrete wall with stone cladding. The solution is similar to the ones applied at modernization of embankments in the area of Wawel.

For each type of cross-sections the following slope inclination was adopted – as a rule confirmed by static calculations:

- Riverside slope – 1:2.5;
- Landside slope – 1:2.

In exceptional cases the slopes may be even shaped to a value of 1:0.5 in order to limit the acquisition of protected land or the collision with buildings or structures.

Except for the redevelopment and extension of the existing flood embankments for the River Vistula, including backwater embankments for the River Dłubnia, the scope of application also covers redevelopment or protection of the related accompanying infrastructure (embankment locks, descend roads and embankment crossings), and construction, redevelopment, protection or liquidation of the existing road infrastructure (roads, culverts, ramps – descend roads and embankment crossings), power network, gas network, IT network, water supply network and sewerage network. The planned new descend roads most often join the embankment crest with a shelf on the embankment or they remain a bypass of objects in the embankment course (e.g. existing sewerage chambers) or a link with bicycle path. The descend roads joining public roads shall be developed as asphalt ones within sections of several meters.

Reinforced-concrete openwork road slabs were applied for embankment crossings and descend roads, and in case of asphalt roads administered by ZIKiT in Cracow or by ZDP in Wieliczka – asphalt concrete. Their application is necessary to protect the embankment crest against excessive passing over. The application of open-work slabs shall allow for simultaneous maintenance of the surface as partially permeable.

In order to limit the area acquired by embankments of embankment crossings and descend roads – as those often are arable fields – the grade of slopes beyond the embankment was increased to 1:1.5 and within the embanked area to 1:2. The planned new descend roads most often join the embankment crest with a shelf on the embankment or they remain a bypass of objects in the embankment course (e.g. existing sewerage chambers).

Construction of service roads requires development of two maneuvering sites:

- Site no. 1 at chainage km 0+909 of the embankment (embankment's register chainage km 82+101) – a yard with dimensions of 12.5 x 12.5 m is located at the end of a service road accessing Nowohucka Street. An exit from Nowohucka Street is closed with a barrier; thus, the maneuvering site allows for U-turn of vehicles without a necessity of obtaining a consent for exit from the road administrator, i.e. ZIKiT, in case of everyday use and inspection of the embankments.
- Site no. 2 at chainage km 6+411 (embankment's register chainage km 87+604) – a yard with dimensions of 20 x 20 m is located at the culvert located at chainage km 6+442 (embankment's register chainage km 87+635), and it allows for provision of services and use of the culvert in case of flood event by the investor's staff and by fire brigade.

The biggest impact of the planned investment on the environment shall be seen on implementation stage. Due to the works and machines applied the following emission shall occur: gas and dust to the air, noise, waste; those shall however be short-term and reversible nuisances. Acoustic nuisance associated with the development time shall end at the completion of works. Materials shall be delivered to the construction site using public roads, and temporary roads shall be developed beyond the aforementioned areas of valuable habitats.

In order to minimize nuisance associated with implementation of the task in question, the Investor obliged itself to apply the following solutions protecting the environment:

- Construction works to be performed during the day, i.e. from 6.00 am to 10.00 pm;
- Any work done during implementation of the investment shall be performed under constant environmental supervision;
- It is forbidden to undertake any measures to dry the Vistula's oxbow lake in vicinity of Brzegi, as it may affect habitats of various humidity and humid habitats formed there adversely;
- Works shall not be done where valuable environmental habitats occur – riparian forests (91E0, 91F0). Those patches are usually located in a distance from flood embankments, but one shall take care in planning the works, to avoid damaging, e.g. during deliveries of construction material to the construction site. It is forbidden to set the technological roads out through or in a direct vicinity of that habitat. In case of a small distance any work associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- In case of a habitat with oak-elm-ash riparian forest (91F0) at chainage km 0+250 to 0+350 of the Vistula embankment in **section 2**, the riparian forest grows on both sides of the embankment. In that case any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment. One is not allowed to set the technological roads out or locate temporary backyard facilities within that habitat. Any work shall be done with high care to avoid damaging of the surrounding riparian tree-stand.
- It is forbidden to perform works, take natural materials, as well as set the technological roads out in the area of habitat of hay meadows (6510). Any works associated with embankment modernization shall be done only in the area of redevelopment, i.e. foundation of the modernized embankment.
- As a result of identifying a stand of very valuable species of hermit beetle, which is located in old, rotting willows growing at the embankment on the embanked area's side, the works at redevelopment of the embankments in that section were designed to avoid threatening to the existing stand. Relocation of the embankment shall assure the protection of the trees as well as their root system. A technological road shall be placed on the opposite side, i.e. in the area beyond the embankment. Prior to the commencement of works it was expected to additionally protect the trees against damaging and covering using protection made of straw mats and wooden fences. All of the protection works shall be supervised by an environmentalist.
- Any work shall be done to avoid drying of water pits, Vistula oxbow lakes,
- Delivery of construction materials shall be done using hardened roads;
- Delivery of loose materials shall be done using adopted vehicles (transport boxes covered with tarpaulins);
- The Contractor for the investment is obliged to inspect vehicles and construction machines in terms of technical efficiency. In case of machine failure any leakage of operating fluid and fuel shall be neutralized with relevant amount of absorbent stored at every back-up facility.

- Time of operations for diesel machines and vehicles working at idle shall be limited to the minimum through application of an effective work organization.
- Any locations of back-up facilities shall be placed beyond the area of valuable environmental habitats, and also beyond areas of medium and high ornithological value, and beyond habitats of amphibians and beavers,
- Tree trunks located within the work site or in its direct vicinity under risk of mechanical damaging shall be protected against damaging at a height not smaller than 1.5 m from the ground level, and materials shall not be stored and new delivery routes shall not be set out in a distance of 1 m from trunks of trees and shrubs.
- The area of back-up facilities, where machines and trucks would operate, shall be protected. Parts of back-up facilities, tightly insulated from the ground, shall be designated for servicing and fueling of the machines.
- Waste produced during implementation of the investment shall be segregated and selectively stored in containers or in separated sites adapted to that purpose, in conditions preventing dusting and blowing light fractions away, and preventing adverse impact on the environment; they should be consecutively taken over by units certified for their further treatment.
- Logging shall be done only beyond the hatching period for birds, i.e. from the beginning of October to the end of February. In case it would be necessary to perform an additional logging within the hatching period, the works may be done only under supervision of an ornithologist.
- Any work performed in vicinity of hatching habitats of amphibians – identified on an ongoing basis by the environmental supervisor – may be performed only at application of herpetological fencing protecting the construction site against migration of amphibians. In case of identifying specimens of amphibians, they will be caught on an ongoing basis and relocated to substitute habitats existing in a safe distance. A list of those habitats shall be developed for an application on the issuance of derogation for measures forbidden in reference to protected species.

Regional
Director for Environmental Protection
In Cracow
Rafał Rostecki MSc