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**ENVIRONMENTAL IMPACT ASSESSMENT OF RAILWAY LINES**

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**The environmental impact assessment procedure in the Czech Republic**

The process of environmental impact assessment (E.I.A.), introduced into practice by Czech National Council Act No. 244/1992 Coll. on environmental impact assessment constitutes an important element in the system of preventative instruments in environmental protection and is also an important part of environmental policy.

By the acceptance of Act No. 244/1992 Coll. gave some new scope for making decisions about alternatives of development from the point of view of their possible impact on the environment. At the same time, an effective implement was gained for natural application of ecological ethics and ecological policy. Application of the policy of environmental protection in decision-making process is of great significance to the environmental impact assessment, or E.I.A. for short, resulting in the emergence of a new aspect-part of the public in this decision-making process. The general view of the environment as a complex of ecological, economic and health parameters, and an effort to make a complex assessment of the impacts of the proposed activity on these parameters make the procedure different from previous approaches applied to assess investment goals.

Knowledge and experience gained so far from carrying out E.I.A. procedure in the Czech Republic in accordance with Act No. 244/1992 Coll. on environmental impact

assessment substantiate that the legal formalization of subject, purpose and goal of E.I.A. As well as of all subjects interested in E.I.A., bring a certain system into the whole procedure, which is generally regarded as a highly positive step. In most cases differences become evident in approaches of single subjects concerned to E.I.A. procedure, not excluding self-government of communities in question.

Amendment of Act No. 244/1992 Coll. seemed to be very advantageous, especially when application of screening and scoping process were concerned in the decision-making process about the necessity and extent of E.I.A. A new definition of subject of E.I.A., too, appeared as useful, both in accordance with the Act and its follow-up Annexes Nos. 1 and 2. Certain modifications and a clearer arrangement of documentation requested according to Annex No. 3 of the Law are contributory, too. The great necessity also was consistent connection of Act No. 244/1992 Coll. with the other Czech acts on environmental protection and with other legal regulations that cover - to a different extent - problems of E.I.A.

From the above-mentioned facts it is evident that the legislation in the sphere of environmental impact assessment has to be changed.

Preparation of the new legislation on environmental impact assessment in 1999 progressed significantly. In accordance with the approved intent, the full wording of a framework of new Law on environmental impact assessment was prepared in 1999. The draft of new Act fully accepts the approaches employed in this area in the European Union, contained in Directives 85/337/EEC, 97/11/EC, 96/61/EC and E/ECE/1250.

This draft of new Act on environmental impact assessment prepared by the Ministry of Environment was approved by the Government of the Czech Republic in September 1999 and in May 2000. Then the draft of new Act was discussed by the Parliamentary Assembly and Senate of the Parliament of the Czech Republic. The Parliament has passed the new Act on environmental impact assessment on February 20, 2001 as the **Act No. 100/2001 Coll. on environmental impact assessment**.

The Act regulates the environmental impact assessment of planned construction, activities, technologies, and development concepts also in transboundary context.

Extent of assessment (according to § 2 of the Act No. 100/2001 Coll.). The assessment shall include an evaluation of the assumed of impact of the construction, activity or technology on population, on fauna and flora, on ecological systems, soil, rock formation, water, ambient air, climatic conditions, landscape, natural resources and cultural monuments.

Basic Concepts (according to § 3 of the Act). The subject of assessment are constructions, activities and technologies listed in Annex No. 1 of this Act (as mentioned below), concerned area, which could be affected by realization of constructions, activities and technologies, and concerned bodies of state administration.

Subject of assessment is dealt with in Section 4 (§ 4), Act No. 100/2001 Coll. on environmental impact assessment referring to Annex No. 1 of the Act, where enumeration of constructions, activities and technologies is stated that are due to be assessed according to the Act. The Annex No. 1 consists of two parts - the first part of this Annex is Category I and the second part is Category II. Category I includes constructions, activities and technologies, which must be always assessed (obligatory assessment). Category II includes constructions, activities and technologies, which can be assessed (after performing screening process according § 7 - facultative assessment). The Section 4 also regulates the environmental impact assessment of changes of constructions, activities and technologies.

**Fact-finding procedures** (according to § 7 of the Act No. 100/2001 Coll.). Fact-finding procedure is completely new part of the Act. The old Act No. 244/1992 Coll. on environmental impact assessment does not include the same chapter. The content of Section 7 gives an answer to the question if to perform or not E.I.A. procedure and how improve the documentation. The competent authority (The Ministry of the Environment of the Czech Republic and Regional Offices) e.g. may require the documentation be supplemented, in particular, with alternative solutions.

**Notification.** Every natural person and legal person who intends to implement a plan (hereinafter the „notifier“) shall be obliged to submit notification of the plan to the Ministry of the Environment or the regional authority. The notifier shall be obliged to submit the notification to relevant authority in writing and on a technical data carrier, or to send it by electronic mail (in electronic form). The requisites of the notification are laid down in Annex No. 3 to the Act No. 100/2001 Coll.

**Documentation** (§ 8 of the Act No. 100/2001 Coll.). The content and extent of the documentation is determined in Annex No. 4 of this Act. The competent authority shall make the documentation public within 5 days on Internet and, without delay, shall dispatch the documentation to the concerned bodies of state administration and to the affected community. The competent authority may require the documentation be supplemented or remade within 40 days after notification (the competent authority shall give back the documentation to notifier). Otherwise the competent authority shall dispatch the documentation to authorized person, who will make an expert opinion.

**Expert report** (§ 9 of the Act No. 100/2001 Coll.). The competent authority shall without delay ensure the elaboration of an expert opinion based on the documentation, taking into account the public opinion, the opinion of the affected community and the opinion of the concerned bodies of the state administration, within a period 60 days after these materials have been submitted. This period can be extended in reasonable cases, however, for not longer than another 30 days.

The expert report can be elaborated by authorized persons only. Authorized persons who have taken part in the elaboration of documentation are excluded from elaboration of the expert opinion. The notifier is obligated to provide the persons that are

elaborating the expert opinion at their request, with additional information necessary for the elaboration of the expert opinion.

The Act No. 100/2001 Coll. on environmental impact assessment includes changing, temporary, and cancelling provisions. The Law also includes 7 Annexes.

The Act No. 100/2001 Coll. on environmental impact assessment came into effect in the Czech Republic on January 1, 2002.

Course of environmental impact assessment procedure is shown in **Scheme No. 1**.

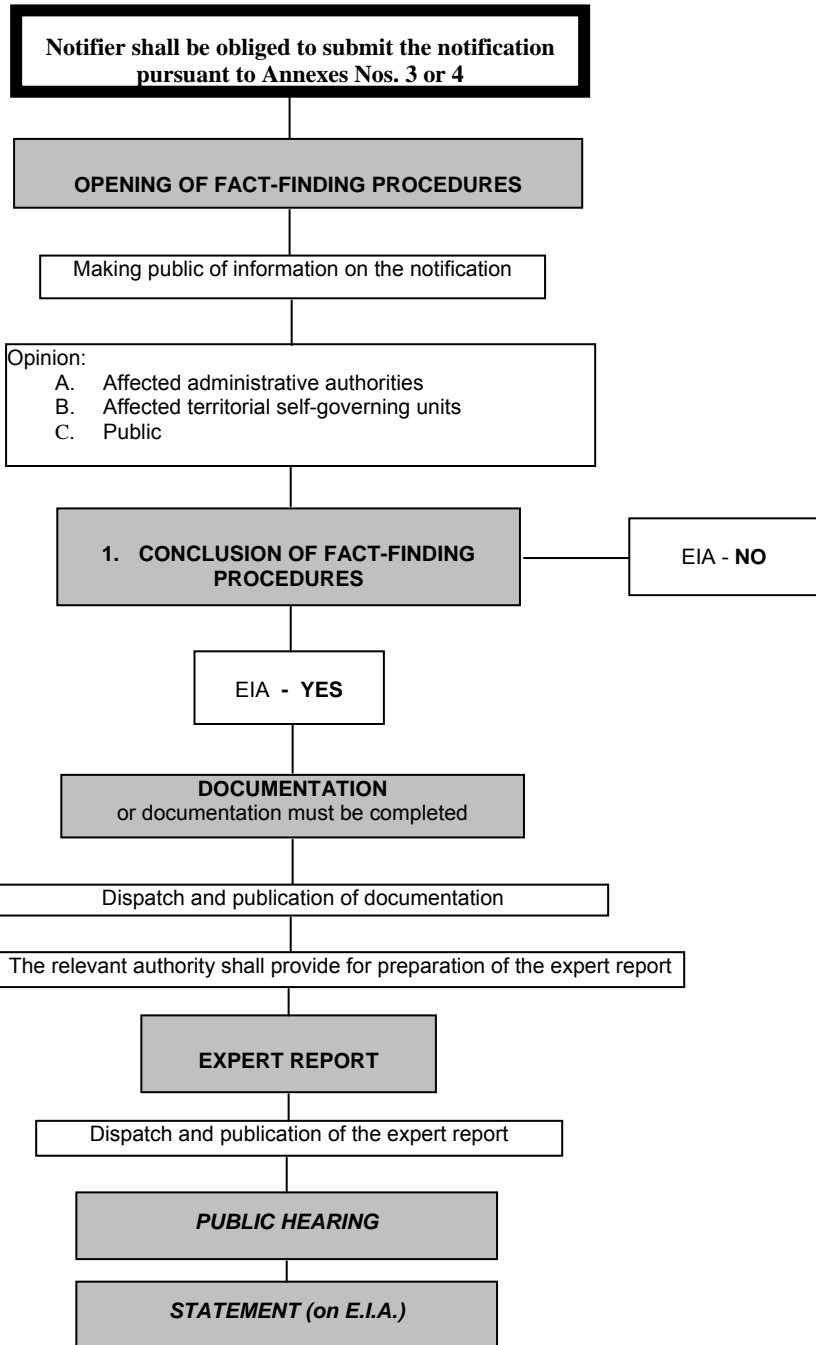
On May 1, 2004 shall come into effect Act No. 93/2004 Coll., which amends Act No. 100/2001 Coll. Many paragraphs of present Act No. 100/2001 Coll. will be changed including Annex No. 1 to Act No. 100/2001 Coll. Annexes Nos. 7 and 8 shall be entirely changed. Annex No. 1 to Act No. 100/2001 Coll. consists of two Categories (I and II). Category I involves plans, which shall always be subject to assessment and Category II involves plans requiring fact-finding procedures. Many parts of Annex No. 1 will be changed.

In Czech Republic where the process of assessment of influences affecting life environment has proceeded virtually since February 1992 the intentions for many domains have been assessed. They concern above all the construction of transport infrastructure (highways, high speed motorways, railway lines, airfields), industrial premises (automobile production industry, chemical industry, textile industry, metallurgical plants), mining of mineral raw materials (hard coal and brown coal mines, extraction of stone and sand), construction within domain of waste management (waste tips, decontamination areas, assorting lines, stockyards of dangerous materials, car cemeteries), commercial and store centres and agricultural premises.

The paper will deal hereafter with impacts of railway lines on life environment. The assessment of environmental impacts of railway lines will be demonstrated in assessing of effects of optimisation of railway division *Dětmarovice – Mosty u Jablunkova*, state frontier of Slovak Republic.

### **Characteristics of railway division to be assessed**

Within frame of international agreements Czech Republic has been obliged to modernize routes of railway lines in its territory in order to facilitate passage of international train rolling stocks. The work on project of Czech Railways (hereafter ČD) – Modernization of selected railway corridors started in 1993 when the routes of four railway corridors crossing the territory of Czech Republic were laid out. The assessed railway division *Dětmarovice – Mosty u Jablunkova (state frontier)* is an integral part of so called corridor III. This third railway corridor has been laid up from German frontier via



**Scheme No. 1** *Environmental Impact Assessment Procedure pursuant to Act No. 100/2001 Coll.*

*Pilsen* and *Prague*, then along the route of first corridor up to *Česká Třebová*, hence as third corridor up to *Přerov*, hence along the route of second corridor up to *Dětmorovice* and afterwards as third corridor via *Český Těšín* and *Třinec* up to the state frontier of Slovakia. The original construction of this railway division started at the end of 1867 and it was finished in 1871. The total distance of optimised railway division *Dětmorovice – Mosty u Jablunkova*, state frontier is approximately 54.5 km (from the railway kilometer 286.539 – up to railway kilometer 341.075). The proposed speed of rolling stocks has been specified for a range of up to 160 km/h.

A territorial technological study (02/2002), to be elaborated on order of ČD by the firm SUDOP Brno Ltd for the railway division of interest was worked out in the following two variants:

A. Optimisation was solved with a minimum shifting of tracks. The adaptations of direction guidance consisted above all in lengthening of transition curves and increase of superelevation of track curves so as to achieve the required running speed.

B. Such variant takes into consideration local relayings of track with maximum shifting of up to 44 m to enable homogenizing of running speed to 95 km/h for conventional train rolling stocks between Slovak frontier and *Jablunkov-Návsí* as well as to 120 km/h for conventional train rolling stocks between *Jablunkov-Návsí* and *Třinec*.

By the expert committee of ČD for assessment of scope of modernization of railway corridors the variant B was selected for working-out in further stages of project documentation with a few exceptions where the variant A should be followed (for instance within railway length between railway stations of *Karviná-Louky* and *Karviná-main station*). In this way the investor has considered the optimisation of railway line only according to a single variant, which became subject to assessment in evaluated documentation (within frame of evaluating variant it was designated as variant V1).

The proposal of direction solution of optimisation respects therefore the existing guidance of railway track; only in six railway line segments, due to straightening of small radius curves a relaying of railway track shall occur. The construction is located in a maximum extent in railway plots and it is guided in its direction and elevation within the existing track bed.

Within frame of optimising of the assessed railway division both permanent and temporary sequesterings of plots belonging to agricultural land fund and of plots reserved for forestry functions will be made. The temporary sequesterings include areas necessary for realising of construction work (construction site areas) and for building-up of access communications (such as erecting and adapting of construction site communications etc.). Temporary sequestering of plots should not exceed a one-year period and after termination of sequestering the plots should be restored to original condition.

The main tracks shall be reconstructed along the total assessed railway division. The reconstruction of main tracks will be carried out by applying of UIC 60 superstructure on concrete sleepers with elastic fixation of rails and a 600 mm spacing. The ballast bed shall have a thickness of 35 cm below bearing surface of sleeper. The track will be realised without rail joints by means of long rail bands.

The draining of base layers of substructure will be safeguarded by reinforced channels, evaporation channels, drainage pipes and channel walls.

Along the division of interest there are at present 28 level crossings of surface communications. All crossings shall be reconstructed, the crossing at km 316.079 should be cancelled due to shifting of railway line (the crossing of road and railway will be solved in the new permanent way by means of road underpass).

Within the optimised railway division 58 bridges and 75 culverts are located. Many of them do not satisfy optimising requirements on width or on construction design and it will be necessary to replace their bearing structure and to repair or eventually to reconstruct their subgrade. For all bridges a reconstruction is proposed so that they would comply subsequently with load class D4/120 and with UIC-GC cross section. If a bridge premises complies with requirements on load capacity and spatial clearance, only a repair of bearing structure, new insulating, repair of masonry of subgrade and new coating of steel parts shall be performed. The division of interest includes also two single-track tunnels – the *Jablunkov* tunnel No1 of 1870 on track No 1 and the *Jablunkov* tunnel No 2 of 1917 on track No 2. At present the running clearance is not convenient and after a preliminary building technology survey their reconstruction appears as the most suitable solution.

The railway line is equally crossed by 23 fly-over artificial crossings, out of which 8 road over passes, 8 foot bridges, 2 railway fly-over crossings and 5 energy supply or conveyor bridges

Technological equipment safeguarding security of traffic along the assessed railway division shall be designed so as to comply with requirements of optimising. In total railway division a reconstruction of traction system for a running speed of 160 km/h as well as reconstruction of trackage and reconstruction of protective netting shall be accomplished.

Optimisation will be made at a full operation of railway transport, however, a number of long-term stoppages will be required. According to ÚPN VÚC Beskydy which was approved by ČR government decree No 298 of 25.4.2002 the modernization of third railway corridor along railway line No 320 *Bohumín-Mosty u Jablunkova* – state frontier of Slovak Republik has been classified among constructions of public interest. It is assumed that the optimisation will be started in 2007 by stage I of construction work (railway line segment between *Bystřice nad Olší* and *Český Těšín*) and it will be terminated in 2010 by a III. stage of construction work. Exact terms of implementing of particular stages of construction work will be specified in further stages of project documentation.

It can be stated that the proposed optimisation of railway division *Dětmarovice – Mosty u Jablunkova*, state frontier, can be evaluated positively both from technological and environmental points of view. Its solution corresponds with contemporary state of technical progress and it can be recommended for realisation.

Optimisation of railway division *Dětmarovice – Mosty u Jablunkova*, state frontier, represents an intention of big investment scope (although its total costs have not been quantified as yet), which might have certain negative impacts on environment. It is, therefore, necessary to minimize such impacts by a comprehensive technical and technological solution, but most probably they cannot be entirely excluded).

### **Analysis of environmental effects of assessed optimisation of railway line**

When assessing the effects of optimisation of railway line on life environment it is necessary to observe the following factors:

1. noise level,
2. impacts on soil, surface water and ground water,
3. transport of materials during the period of optimising of railway line
4. emission-immission situation
5. impacts on flora, fauna and ecological systems,
6. waste management.

#### **Noise level:**

Noise level represented the most problematic factor in the assessed intention. Within frame of elaboration of documentation, therefore, an extensive noise measurement survey was organised along the assessed railway line segment where in 24 measuring sites the all-day noise measurement was realised during a period of 24 hours. In the remaining 42 sites the noise measurement was carried-out for a period of one or two hours (short-term measurement). In view of fulfilment of limit noise values with including of correction due to old load, i.e. of 67 dB at day and 62 dB at night, today 22 points from 66 or 33% fulfil them. Fulfilment of the limit parameters, i.e. 72 dB at day and 67 dB at night, was reached moreover in other six points in protective zone of railway and in other three points in uncertainty zone. The fulfilment of hygienic limit values with including of correction due to old load is thus reached in 42% of measuring points. From the values mentioned in documentation it is obvious that only in one measuring point today the parameters of non-exceeding outlook limit values of noise for the optimised railway line at 55 dB at day and 50 dB at night are fulfilled. It is a measuring point located in the north of Karviná which is in a sufficient distance from railway line and behind an area of gardening plots. The fulfilment of 60 dB parameter at day and of 55 dB parameter



at night in protective zone of railway - again for the outlook period after optimisation - was identified only in a single point and in uncertainty zone in two points.

The noise situation in ambient space was assessed also for the outlook period by means of a model calculation of equivalent noise levels. It results from calculations that the reduction of noise load in surroundings of railway line will oscillate between 0.5÷4.7 dB at day and between 0.5÷4.1 dB at night. In average it will be an improvement by 1.0 up to 2.5 dB. At foothills of Beskides towards the frontier of Slovak Republic the reduction of noise load will be higher (by 3.5÷4.7 dB) which is given above all by lower proposed running speed of trains in this area (90÷120 km/h) when compared with other railway line segments, where – as it was already mentioned above – a running speed of up 160 km is assumed.

It is necessary to state that the optimisation of the assessed railway line shall bring about in any case a reduction of outlook noise emission of railway transport in the territory of interest and thus a reduced noise attacking of premises in surroundings of railway line when compared with the present state (if the current frequency of train traffic will be preserved unchanged). The reduction of noise level generated by railway traffic shall be achieved by higher quality of railway superstructure with elastic bearing of rails on tieplates and of tieplates on sleepers, by improvement of parameters of ballast bed and by application of rails with ground rail joints (all the above-mentioned improvements will be applied also for reconstructed bridges). Equally train sets with better technical parameters will be used, among other they will be equipped with disk brakes with lower noise level). It is highly probable that due to these changes a reduction of noise load of ambient territory by values of about 5.0÷6.0 dB against the present railway traffic conditions as well as a reduction by about 1.0-3.0 dB during day and night related to outlook of railway traffic in the assessed railway line can be expected. The existing steel bridges in the assessed railway line segment (some of them are dated already in 1871) shall be dismantled and withdrawn and they shall be replaced by reinforced concrete bridges with continuous ballast bed (equally on bridge decking) and in this way an important reduction of noise emissions in surroundings of bridges will be achieved.

Considering that along the assessed railway line a relatively big number of premises is located which are attacked by noise of above-limit value it will be necessary to proceed to their protection. The primary method of protection is to solve protecting by means of noise control walls or barriers. Along the optimized segment of railway line in total 37 noise control walls and a single noise control barrier have been proposed. Both the conventional 1.5÷3.5 m high noise control walls (either with absorbing or with reflective surface) and the noise control elements featured by full fencing of railway stations with noise control effect have been designed.

Noise protection of other noise attacked premises in which the situation could not be improved by means of screening nature, shall be solved by means of individual noise control measures in particular premises. It can be considered either a total substitution of

the existing windows for windows with higher degree of air soundproofness or a substitution for acoustic type of windows with high degree of soundproofness (in a limited extent).

In certain localities (*Třinec, Český Těšín* etc.) it will be suitable to realize noise control measures in advance of proper implementing of optimisation of railway line. It will be most proper that the competent bodies of state administration during preparing phase of their territorial planning should reconsider eventual situation of new residential built-up areas in close vicinity of the assessed railway line.

During period of realisation of this optimising intention it will be necessary to stop the construction work in vicinity of residential built-up area at night time, respectively from 9 o'clock p.m. up to 7 o'clock a.m., and not to exceed the limit period of 9 hours when using the most noisy mechanisms in a zone adjacent to built-up area. The noise sources which will be in close distance from built-up area (e.g. compressors, heavy breakers etc.) shall be screened during work by mobile noise control walls.

After starting of operation in particular segments of optimised railway line it will be necessary to safeguard evaluating of noise situation during day and night by measurement in selected checking points which are identical with points monitored within frame of already elaborated noise study. Subsequently, an expert evaluation of effectiveness of realized noise control measures (noise control walls, individual noise control measures) shall be performed and in case of need the execution of further noise control measures shall be safeguarded.

### **Impacts on soil, surface and ground water:**

Within frame of relaying of railway line (straightening of small radius curves) a comprehensivel and permanent sequestering of plots of total area amounting to 24,597 m<sup>2</sup> (about 2,5 ha) shall occur. Based on evidence in cadaster book of immovables this area will include not only the plots in category of "the other and built-up areas", but also the plots belonging to agricultural land fund (gardens, fields of landed property). A maximum temporary sequestering including an area of 20,010 m<sup>2</sup> or about 2 ha, of outside railway property plots has been proposed for erection of construction site. No essential impacts on surface water situation, such as changes of morphology or of routing of river troughs, shall be provoked by realization of the assessed intention. Equally, the today run-off conditions or scope of inundation zones shall not be changed. Only in places of the existing crossings new adaptations of bridge objects and culverts shall be made which will be connected on the on hand with short-term influence on water streams during construction activities and on the other hand they will have a long-term effect on the segment of water stream in place of crossing by their technological and construction solutions. The impact on ground water can be connected only with emergency conditions in course of any stage of the assessed intention. A time-limited exposure of ground water level could happen only when exposing the existing foundations of some premises or

Vladimír Lapčík:

when excavating the base trenches for newly built-up or for substantially reconstructed premises. Depositing of stripped or excavated soil during earth work shall be solved so as to prevent inflow of soil due to rain (especially torrential rain) into troughs of water streams, respectively to safeguard during construction period a continuous cleaning of trash polluted surface water streams or eventually to safeguard during construction period a continuous cleaning of soil polluted surface water streams or eventually to realize temporary protective measures (settling tanks). In construction sites located in an inundation territory no easy floating material should be stored which could act at increased flow rate as an obstacle against water flow. When reconstructing bridge objects or culverts it will be necessary to prevent slides of demolition and building materials into troughs of waterstreams. In case that a slide will occur it would be necessary to safeguard a corrective measure without delay.

In areas of construction equipment it shall not be possible to allow fuel pumping, storing of water contaminating substances or fuel with the exception of a fuel quantity for one-day consumption.

In other stages of project documentation it will be necessary to solve draining of rain water from track bed, primarily by utilisation of the existing sewage network by which water is drained to external ditches or to drainage channels and subsequently to water streams.

For the period both of construction and operation of railway line it will be necessary to elaborate an emergency plan, in which priority routes of escape of harmful substances should be defined including management of harmful substances and of potential emergencies during replacement of transformers. A special attention shall be paid to crossings of railway track with water stream. It will be equally necessary to elaborate a flood control plan for period of construction and operation of railway line which should comply with flood control plans of the concerned municipalities.

In view of condition and age of the existing steel bridges (some of them were built-up in seventies of 19<sup>th</sup> century – see photo in **Fig. 1**) and due to high generation of noise during passage of trains these bridges shall be dismantled and substituted for reinforced concrete bridges with continuous ballast bed (see equally above). Therefore, no sandblasting and renovation of coating of bridge structure shall be performed and due to this the possibility of contamination of water stream by dangerous substances shall be substantially limited.

It will be suitable to incorporate a regular maintenance of culverts into operating rules.

#### **Transport of materials during period of optimising of railway line:**

The scope of transport of materials during period of optimising of railway line will depend on selected technology optimisation. At present time the following two possible procedures can be considered:



**Fig. 1** Bridge across Olše river in Vendryně (km 308,174), which will be reconstructed  
**Obr. 1** Most přes řeku Olši ve Vendryni (dráž. km 308,174), který bude rekonstruován

The first one is a **procedure of pulling-down of track bed**. As it is indicated by its name at first the track grate is pulled-down in the railway line segment which is subject to construction work. The time of construction of one kilometer with this technology takes in average thirteen working days. From the time point of view the total railway line segment during total period of renovating of substructure and superstructure is exposed to effects of truck transport, of proper construction work and of climatic conditions. During a half of period of renovating of substructure and superstructure the construction site and its environs are loaded by intense truck haulage of big quantities of material – the transport demand is about 18 t per linear meter (hereafter 1m) of track renovation and all this transport activity must be realised outside the track bed which is being pulled-down. So it takes about 2000÷2500 runs per kilometer of track bed renovation.

The second technology is **procedure without pulling-down of track grate**. The period of construction of one kilometer of a single track takes with application of this procedure 5.5 working days. Not all track segment to be renovated is exposed, only its minor part. At a mean renovation rate of 60 1m/h the time of opening of workplace of 3 m length takes about three (3) minutes. Equally for this technology it is necessary to bring in material. Thus during total time of renovation a technological traffic between the base, dumping ground and proper machine must proceed within the construction work segment. However, the construction site traffic is exclusively railway traffic (all what is needed by technology is brought in by railway waggons) and it is operated by diesel traction. In spite of all advantages of the technology without pulling-down of track grate of

considerable height it is necessary to remember that this technology has also some disadvantages (noise emissions, vibrations) which however due to high output of the equipment is acting on its environment for a substantially shorter time than other procedures.

Naturally, each of the above-mentioned technologies has its pros and cons. The technology with pulling-down of track grate used to be assessed as a cheaper one. At the assessed railway division optimisation a combination of both technologies shall be applied.

In connection with realisation of construction work it will be necessary to safeguard documenting of access communications including technical condition of bridge objects. It will be necessary to realize the newly built-up access communications as reinforced ones (the reinforcement should be safeguarded equally for usage period of the existing non-reinforced access roads). Equally the installations of construction sites shall be reinforced by concrete panels. It will be suitable to prefer the location of recycling bases within railway plots (on reinforced areas) in sufficient distance from residential built-up area.



**Fig. 2** Between railway stations Karviná and Dětmárovice the railway is located along dams of fishponds (Vdovec, Olšový etc.) – from km 335,650 to km 339,675.

**Obr. 2** Mezi nádražím Karviná a žst. Dětmárovice je železniční trať vedena po hrázích rybníků (Vdovec, Olšový atd.) – mezi drážním km 335,650 a 339,675.

### **Emission-immision situation:**

Optimisation of railway line can have an impact on atmospheric air quality, above all during period of proper realisation of construction activities. During this for a clearly time defined and in view of scope of total activities relatively short period a temporary affecting of air quality can occur.

In connection with the above-mentioned facts it will be necessary to elaborate dispersion studies, an expert opinion on impact of construction work on air atmosphere and an expert opinion on effect of construction work on the health of inhabitants and on life environment. The conclusions of the last-mentioned studies shall be projected subsequently to laying-out of access communications to particular construction sites and construction objects (bridge objects, culverts) and into locating of main installations of construction sites and of recycling lines.

During construction stage it will be necessary to realize in compliance with valid legislation the measures for reducing of dust content in atmosphere of particular construction work sites (e.g. by corresponding sprinkling during construction period), especially in case of demolition work (of buildings, bridges, culverts etc.).

### **Impacts on flora, fauna and ecological systems:**

Between railway stations of Karviná and Dětmárovice the railway line is located along dams of fishponds (**fig. 2**). For the protected territory NATURA 2000 – SPA which is situated between the above-mentioned railway station on railway km 335.650 up to 339.675 it is planned the application of technology without pulling-down of track grate (see above). By means of applying of technology without pulling-down of track grate the reconstruction of this railway line segment should be implemented during a period outside the nesting season of birds, i.e. outside the months of March through July.

Within frame of elaboration of project of territorial management or eventually of other stages of project documentation it shall be necessary to carry out the following biological surveys:

- Dendrology research of areas in which it will be necessary to perform elimination of the existing timber vegetation. Within frame of dendrology survey it will be necessary to pay attention also to occurrence of special protected species of plants in the concerned localities. The results of dendrology survey shall further serve among other as bases for elaboration of project of vegetation adjustments and for determination of scope of substitution planting.
- Ichthyologic survey and evaluation of detected species structure of ichthyofauna in concerned segments of water streams. This biotic component used to be endangered most frequently and in the greatest extent both during construction period (e.g. by increased risk of poisoning connected with

Vladimír Lapčík:

escaping of cement water during execution of construction work) and by improper implementing of construction objects (e.g. transversal steps in water streams, forming of migration barriers or hard adaptation of water stream bottom in under bridge area where fishes cannot repose or hide). The conclusions of the survey can be subsequently applied for projects of bridge objects and culverts so as to prevent worsening of life conditions for indicated species by construction realisation. Within frame of ichthyologic survey it will be also possible to identify suitable localities for eventual transfer of fishes.

The biggest concentration of amphibia can be expected in the SPA locality where already now the application of the most regardful technology of track reconstruction (i.e. technology without pulling-down of track grate) has been proposed in order to minimize potential affecting of their sites. In view of detailed assessment an important group are the reptiles. Above all the common lizard is concerned (*Lacerta agilis* – a very endangered species) which in localities lacking other suitable areas likes to be sited in railway embankments or trackage areas of railway stations or stops. Within total locality of the assessed railway line the most frequent occurrence of common lizards was registered just in the railway segment in SPA territory. Due to existence of extensive water areas (fishponds) in this locality and due to lack of other suitable localities this species of lizards occurs here mainly in track bed. During elaboration of further stages of project documentation it will be proper to identify suitable areas for realisation of so called „lizard hills“

The avifauna (birds) could be affected above all during construction period or during preparatory construction work. It appears that liquidation of shrubs accompanying the railway line appears as the most important problem. They were planted spontaneously in railway plots and they are frequently used by little birds during their migration or as the sites suitable for bird nesting. For this reason it will be necessary to carry out the cutting down of timber and shrubs during period of vegetation pause so as to prevent destroying of nests with eggs or chicks.

It is necessary to state that within frame of elaboration of project for territorial management procedure, or eventually for further stages of project documentation it will be necessary to perform a detailed biological field survey of particular localities of the assessed railway line (especially in the proposed SPA domain, in places of temporary construction sites and in places of crossing of railway line with water streams, with special attention paid to reptiles, invertebrates etc.). For surveys of local conditions it will be suitable to utilize knowledge of experts of the given region.

Prior to starting of decisive earthwork activities it will be necessary to safeguard liquidation of neoindegenofyts (cow parsnip, hogweed etc.) by chemical and mechanical methods in railway plots and in the plots which shall be affected by optimisation of corridor both by chemical and mechanical methods.

### **Waste management:**

In another stage of project documentation a review of the expected quantities of waste materials including their kinds and categories and the problematics of spaces and places for accumulation and classification of dangerous waste and of the other waste shall be resolved. It shall be necessary to support by contracts (or by preliminary contracts) with specialised firms the method of waste utilization or eventually of disposal of waste produced in connection with realisation of railway track optimization. For final approval of construction work the documents shall be presented about evidence of waste produced during realisation of construction.

In the next stage of project documentation a proposal of procedure shall be elaborated in case of detection of eventual contamination of excavated soil including a concrete proposal of further disposal of eventually contaminated soil (storage in dumps of corresponding waste groups etc.).

It will be necessary to safeguard collecting of samples in places of cancellation or of building reconstruction of road passovers as well as a subsequent analysing of tar content in samples. The total quantity of waste with tar content (dangerous waste) shall be determined. Equally it will be necessary to safeguard collecting of samples of ballast bed in places of its potential contamination and subsequent analysing of samples by which the content of non-polar extractible substances (especially on sliding parts of switches) shall be specified and a total quantity of contaminated ballast shall be determined. A contaminated ballast shall be subsequently handled as a waste of corresponding category. All analyses shall be performed by accredited laboratories.

In connection with realisation of construction work it will be necessary to safeguard recycling of a maximum volume of non-contaminated construction debris and to reuse it subsequently for renovating of railway line. The other waste will be classified and offered for utilization and recycling. Spaces and vessels shall be provided for separation and storage of waste material including dangerous waste produced during optimisation of railway line. Records of waste shall be kept by the firm realizing the construction. Non-usable waste materials shall be submitted for liquidation or for secondary use exclusively to the firm which is accredited to do such activity (the contractor of construction work is obliged to assure the disposal of waste by means of contract concluded with an accredited firm). Combustion on construction sites of waste or of wood substance of eliminated timber and shrubs shall not be allowed.

This is perhaps all concerning the most important environmental impacts which have been identified in connection with optimisation of railway division *Dětmarovice-Mosty u Jablunkova*, state frontier of Slovakian Republic.



The investor has taken into consideration the optimisation of railway line only **according to a single variant** which became subject of assessment in the documentation evaluated - within frame of evaluating of variants it was marked as variant V1 (see above also). In course of work on documentation the negotiations between representatives of the *Hrádek* municipality and the representatives of ČD as well as of Ředitelství silnic a dálnic (Headquarters of Highways and High Speed Motorways) proceeded which concerned creating of a common traffic corridor (railway and highway I/11) passing through the last mentioned municipality. This variant, being marked in documentation as **V2**, is within total length of the optimized corridor identical with the **V1** variant. The only exception is passage of railway line across the *Hrádek* municipality where a shifting of track bed against the existing direction guidance is considered so as to enable creating of common traffic corridor. A last variant which has been evaluated in documentation is the zero variant (**V0**). The prerequisite of this variant is that no optimization of railway line should proceed, but the railway line would be let unchanged in the existing condition in which it is today.

The variant V2 has been selected as the most suitable. However, it is necessary to remark that creating of common traffic corridor will cause a shifting of railway line by 7-13 m within the municipality of *Hrádek*. Without realizing of the corridor the railway line would remain by its direction within the existing track bed section.

It can be stated that the result assessment of variants in the evaluated documentation is acceptable for the given case.

After publishing the written suggestions of eleven (11) citizens were submitted to the presented documentation (in a single case a single citizen represented opinions of other eleven citizens), of a civil association ZO ČSOP Olza and of two juristic entities.

Furthermore, in the assessment the statements of some *concerned territorial self-governing units* were commented including (according to sequence of railway kilometer marking) the municipalities: *Bystrice nad Olší*, the towns of *Třinec* and *Český Těšín*, the statutory town *Karviná* and the municipality *Dětmorovice*. In the assessment statements of the following *concerned administration authorities* were commented (equally according to sequence of railway kilometer marking): municipality council of *Lomná*, town council's of *Jablunkov* environmental department (2 statements) building and environmental department of town council of *Český Těšín*, environmental department of town council of *Karviná*, Czech Inspection of Life Environment - its regional inspectorate in *Ostrava*, Regional Hygiene Station of Moravosilesian region sited in *Ostrava*. In other statements concerning the documentation (municipal council of *Vendryně*, Ministry of Health Care, department of hygiene and epidemiology) no comments were mentioned.

The comments were discussed and settled with the above-mentioned subjects by the elaborator of opinion, although it was very time demanding due to number of comments and of submitting entities. The last-mentioned comments were reflected also in the proposal of position of opinion which recommended for the preparing stage 35 terms, for the realisation stage of intention 27 terms and for the operation stage 5 terms.

A public discussion about the intention has proceeded with a positive result at the building of town council of *Třinec* on 12<sup>th</sup> February 2004.

*Lektoroval: Doc.RNDr. Jaroslava Machalíková, CSc.*

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### Resumé

#### ASSESSMENT OF IMPACTS OF RAILWAY LINES ON LIFE ENVIRONMENT

Vladimír LAPČÍK

V České republice proces posuzování vlivů na životní prostředí prakticky probíhá od února roku 1992. Do konce roku 2001 platil zákon ČNR č. 244/1992 Sb., o posuzování vlivů na životní prostředí. Již v průběhu prvních let platnosti se ukázalo, že bude nutno zákon č. 244/1992 Sb., o posuzování vlivů na životní prostředí, novelizovat. Analýzy zákona č. 244/1992 Sb. ukázaly některé nedostatky, které se týkaly zejména absence některých standardních fází procesu posuzování (zjišťovací řízení, zadání pro zpracování dokumentace - scoping process). Uvedené nedostatky patřily zároveň i mezi příčiny nekompatibility této právní úpravy posuzování vlivů na životní prostředí s právem Evropské unie. Nový zákon o posuzování vlivů na životní prostředí č. 100/2001 Sb. nabyl účinnosti dnem 1. ledna 2002.

Vladimír Lapčík:

Nový zákon mj. zahrnuje zjišťovací řízení, umožňuje příslušným úřadům určit rozsah zadání pro zpracování dokumentace a řeší i problematiku posuzování vlivů na životní prostředí přesahující státní hranice.

Poslední novelizací právní úpravy v oblasti posuzování vlivů na životní prostředí je přijetí zákona č. 93/2004 Sb., kterým se mění zákon č. 100/2001 Sb., o posuzování vlivů na životní prostředí a o změně některých souvisejících zákonů. Novelizace nabyla právní účinnosti dnem 1.5.2004.

Je možno konstatovat, že byly a jsou posuzovány záměry v mnoha oblastech. Jedná se především o stavby dopravní infrastruktury (silnice, dálnice, železniční tratě, letiště), průmyslové objekty (automobilový průmysl, chemický průmysl, textilní průmysl, hutě), těžba nerostných surovin (černouhelné a hnědouhelné doly, těžba kamene a písku), stavby z oblasti odpadového hospodářství (sklárky, dekontaminační plochy, třídící linky, sklady nebezpečných odpadů, autovrakoviště), obchodní a skladová centra a zemědělské stavby.

Příspěvek se dále podrobně zabývá posuzováním vlivů železničních tratí na životní prostředí. Posuzování vlivů železničních tratí na životní prostředí je demonstrováno na posuzování vlivů optimalizace traťového úseku Dětmarovice – Mosty u Jablunkova, státní hranice se Slovenskou republikou na životní prostředí.

V rámci mezinárodních dohod se Česká republika zavázala modernizovat trasy železničních tratí na našem území z důvodu usnadnění průjezdu mezinárodních vlakových souprav. Posuzovaný úsek železniční trati je součástí tzv. III. koridoru. Celková délka optimalizovaného úseku Dětmarovice - Mosty u Jablunkova, státní hranice je cca 54,5 km (dražní km 286,539 - 341,075).

Při posuzování vlivů optimalizace trati na životní prostředí je nutno sledovat zejména následující faktory: hluk, vlivy na půdu, povrchové a podzemní vody, dopravu materiálů v období optimalizace trati, emisně–imisní situaci, vlivy na flóru, faunu a ekosystémy a nakládání s odpady. Součástí příspěvku je obsáhlá analýza výše uvedených vlivů posuzované optimalizace trati na životní prostředí.

Závěrem je uveden přehled vypořádaných připomínek občanů, občanských sdružení, dotčených územních samosprávných celků a dotčených správních úřadů. Do návrhu stanoviska posudku se promítlo pro fázi přípravy 35 podmínek, pro fázi realizace záměru 27 podmínek a pro fázi provozu 5 podmínek.

Veřejné projednání záměru s kladným výsledkem proběhlo v budově Městského úřadu v Třinci dne 12.2.2004.

## Summary

### ASSESSMENT OF IMPACTS OF RAILWAY LINES ON LIFE ENVIRONMENT

Vladimír LAPČÍK

In the Czech Republic where the process of assessment of influences affecting environment has proceeded virtually since February 1992 the intentions for many domains have been assessed. They concern above all the construction of transport infrastructure (highways, high speed motorways, railway lines, airfields), industrial premises (automobile production industry, chemical industry, textile industry, metallurgical plants), mining of mineral raw materials (hard coal and brown coal mines, extraction of stone and sand), construction within domain of waste management (landfills, decontamination areas, assorting lines, facilities for storing hazardous waste and for processing car wrecks), commercial and store centres and agricultural premises.

The paper describes steps of environmental impact assessment process pursuant to the Czech Act No. 100/2001 Coll. on environmental impact assessment.

The paper deals hereafter with impacts of railway lines on environment. The assessment of environmental impacts of railway lines will be demonstrated in assessing of effects of optimisation of railway division Dětmarovice – Mosty u Jablunkova, state frontier of Slovak Republic.

## **Zusammenfassung**

### **NAME IHRES ARTIKELS**

Jméno PŘÍJMENÍ

Das tschechische Gesetz über die Umweltverträglichkeitsprüfung vom 20. Februar 2001 (Nr. 100/2001), zuletzt geändert durch Gesetz vom 29. Januar 2004 (Nr. 93/2004) wurde.

Die Umweltverträglichkeitsprüfung ist entsprechend § 1 des Gesetzes über die Umweltverträglichkeitsprüfung selbständiger Teil verwaltungsbehördlicher Verfahren. Sie ist gemäß dem Gesetze über die Umweltverträglichkeitsprüfung mit Vorrang für Vorhaben mit zu erwartenden erheblichen oder nachhaltigen Auswirkungen auf die Umwelt durchzuführen.

Im Rahmen der Verfahren beurteilt die zuständige Behörde die möglichen Umweltauswirkungen von Vorhaben, bzw. Projekten auf der Grundlage der durch die jeweiligen Vorhabensträger eingereichten Unterlagen. Das Ergebnis der Beurteilung wird durch Abwägung einer Vielzahl von zu bedenkenden Sachverhalten in der sich anschließenden Entscheidungsfindung über die Zulässigkeit des Vorhabens, bzw. Projekts berücksichtigt.

Die Umweltverträglichkeitsprüfung erfolgt unter Einbeziehung der Öffentlichkeit.

Der Artikel weiter beschreibt die Umweltverträglichkeitsprüfung der Eisenbahnstrecke Dětmarovice - Mosty u Jablunkova, Staatsgrenze mit Slowakei.