ANNEX IV

NON TECHNICAL SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT

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ENVIRONMENTAL IMPACT STUDY

SUMMARY

The aim of this project is the reconstruction of the existing main railway track line No. 30A between sections of Budapest-Kelenföld station and Székesfehérvár (Hungary) as the 1st phase of the Budapest-Székesfehérvár-Boba railway line major reconstruction project, with a total length of 61.1 km, because of the worn condition of the railway infrastructure. The purpose is:

- to increase the travel speed and axle loading, and
- to enhance train traffic.

The section to be reconstructed belongs to one of the busiest tourist corridor in the middle of the country, between the capital and Lake Balaton.

The reason for EIA obligation of the planned project falls into the category of increasing the service capacity of an existing infrastructure. Therefore, the complex presentation and evaluation of environmental impacts of the existing railway line and present train traffic was not the purpose in EIA preparation for the planned developments.

The main environmental impacts are generated from noise emission of the increased train traffic and speed. Other impacts are not expected to change significantly compared to the present condition. Therefore, the basic conditions of air quality, soil, surface and ground water were not needed to be determined during the impact assessment.

Summarising the existing noise load along the examined railway line the available data shows that limit values are exceeded at most of the populated areas, more significantly at night. The main reason for this can be found:

- mainly in the worn condition of the tracks, as the welded rail joints showing the characteristics of fished joint track;
- partly in the small distance of houses from the tracks at certain locations.

Along the 61.1 km length of the concerned railway section one important area of nature conservation can be found. It is the Dinnyés fertő (morass) area situated to the southeast from the Lake Velence in the fields of village Dinnyés. Its size is 539 ha, the railway track is just passing on embankment at its boarder at appr. 2 km length. The site was declared nature conservation area in 1966. Later it was classified as Ramsar area and also belongs to Natura 2000 network.

A.1. MAIN IMPACTS OF CONSTRUCTION:

Railway rehabilitation will be made on the existing track line, thus in view of the existing conditions new cutting of habitat will not occur, the extent of habitat loss is negligible.

The construction at section bordering the Dinnyés-Fertő Nature Conservation Area will be performed with special construction technology occupying only the track area, in order to avoid any use of areas along directly to the track line as e.g. access, deposit or borrow pit areas. The effect may be slightly burdening.

A.2. MAIN IMPACTS OF OPERATION:

According to the calculation results the noise load at houses along the tracks will increase in the daytime period minimum by 2-2,5 dB up to 7 dB as a result of the planned enhanced train traffic and travel speed. The actual values are depending on travel speed and the distance of buildings from the track line. It should be noted that this increase excludes the favourable changes expected from the reconstruction of the tracks.

Considering the present detrimental noise condition of the area and the reasons for that, this impact definitely needs various mitigation measures.

The planned solutions for noise mitigation include:

- noise barriers,
- noise and vibration reduction system built in the railway permanent way
- passive acoustic measures built at houses.

The planned measures were formed in the course of communication series among the designers, the environmental authorities and the municipality of the concerned settlements.

From a broader point of view, indirect effect of the development can be identified in potential decrease of road traffic on the parallel main road due to the developed, favourable train transport condition. The decrease in road traffic may result in improving air quality, thus the planned development may contribute to sustainable development.

According to the available data and information, the planned railway rehabilitation will not result any environmental harm, it does not pollute the environment, no objection could be identified to its implementation. According to the investigations the future noise levels along the track line will decrease compared to the present level after the rehabilitation of the track, and with the implementation of noise reduction measures the meeting of noise protection requirements can be ensured on the long run, too.

INTRODUCTION TO THE HUNGARIAN EIA PROCEDURE

In Hungary, the implementation of EIA is prescribed by the national Act No. 53 of 1995 on the general rules of environmental protection and was regulated by the 20/2001. (II.14.) Gov. decree on EIA at the time of initiation of project design work and submission of the EIS to the environmental authority. This order was valid till December 31, 2005. Since the authority procedure has started earlier, the prescription of this order is to be followed.1

In the course of the Environmental Assessment Procedure an individual environmental permit is issued. The Applicant shall apply for an Environmental Permit for all activities, which are covered by the Governmental Decree on EIA. The acquisition of this permit shall precede the issuance of all other permits of implementation.

The authority entitled to issue the permit is the relevant regional Environmental, Nature and Water Inspectorate.

The Hungarian EIA procedure consists of two stages: the preliminary and – if required – the detailed investigation phases. The preliminary phase – from legal point of view – corresponds with the EU-

[1] The valid regulation is the Gov. Decree No. 314/2005. (XII.25.) on EIA and IPPC procedures having been in force since January 1, 2006.

employed screening and scooping activities combined. The Applicant shall present the investigation results in a Preliminary Environmental Study and in a Detailed Environmental Impact Study, respectively, to the authority. The detailed investigation phase is obligatory ever in the case of particular activities causing considerable impact on the environment and when exceeding the defined dimensions. These all are contended on list 'A' of the regulation (corresponding with Annex I of the relevant EC directive). For activities included in List 'B' the data gathered in the preliminary phase are used as basis for the decision on detailed EIA-obligation.

At the end of the preliminary phase, the authority can reach the following decisions:

- Issues the environmental permit, informs the related local municipality and terminates the procedure (appl. only for activities on B-list)[2],
- Prescribes the preparation of detailed study and defines both the concerns of the study to be investigated further and the requirements which shall as yet be concluded for the implementation, or
- Turns down the application

Informing the public and surveying their opinion is implemented in two ways in the course of the legal procedure:

- In the preliminary phase the authority sends the prepared study to the concerned municipality(ies). The neighbouring municipalities are forwarded a note about the planned investment and the EIA study, then upon their special declaration of being concerned, the Municipality is sent the full study document. The communities concerned are informed about the planned development and on the possibility to review the EIA study by means of a notice exhibited in public or by other local practices. Written notices can be submitted to the Major's Office.
- Public hearing shall be organised by the authority only in case when procedure progresses to the detailed investigation phase.

BRIEF INTRODUCTION OF THE PROJECT

The rail network of Hungary has suffered detrimental effects of insufficient maintenance and lack of necessary repair for many years. As a result, traffic is often delayed, the quality of service is inadequate and travelling conditions are poor. Thus, rail transport has become unreliable, and railway has become much less attractive and competitive in comparison to other modes, and particularly to road transportation.

The aim of this project is the reconstruction of the existing main railway track line No. 30A between sections of Budapest-Kelenföld station and Székesfehérvár, with a total length of 61,1 km because of the worn condition of the railway infrastructure.

The purpose of the reconstructions is:

- to increase the travel speed and axle loading, and
- to enhance train traffic.

[2] According to the new regulation referred, the preliminary phase can not be closed with permission: but with a decision whether the project requires environmental permit or not. Environmental Permit can be issued only based on detailed impact assessment.

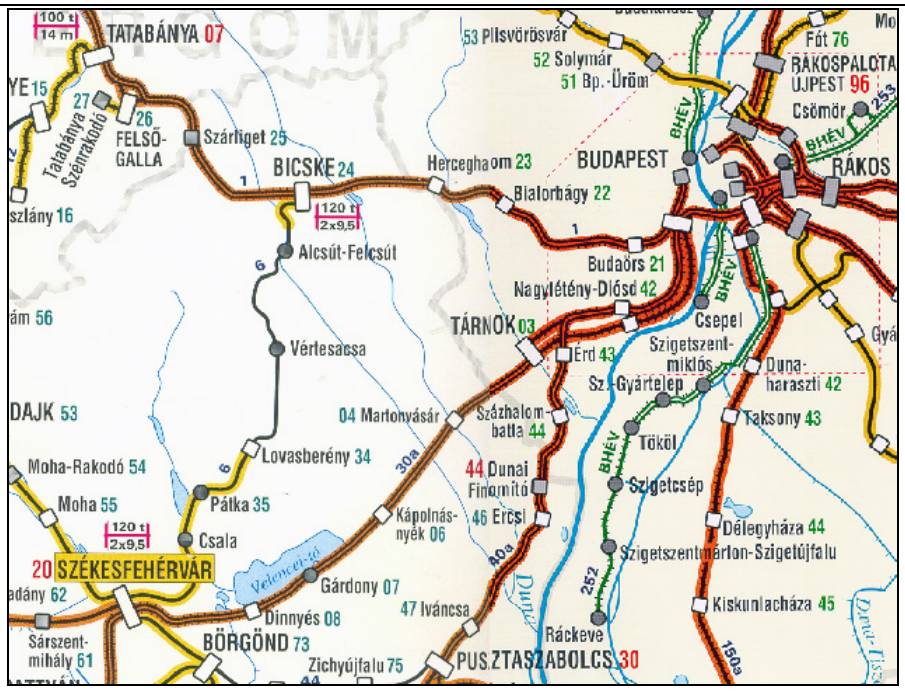
The section to be reconstructed belongs to one of the busiest tourist corridor in the middle of the country, between the capital and Lake Balaton. The settlements of the recreation zone make significant efforts for the development of the region, for the improvement of the condition of the Lake Velence, for the conservation of natural values.

In addition to civil works for tracks and platforms, the modernization of auxiliary services such as signalling, electrification and telecommunication systems will also take place. Since this later type of works and operations do not threaten the environment, this summary is to present the environmental effects related to track reconstruction works and mainly to the planned increase of train traffic.

MAIN PROBLEMS TO BE SOLVED	MODERNIZATION TASKS
▪ The poor condition of some of the track and the track bed has resulted in speed restrictions. The poor track condition is enhanced at many sub-sections by poor drainage.	▪ Renewal of the track and track bed along the line: the objective is the increasing of the train speed up to 160 km/h on the sections Nagytétény – Velencefürdő and Agárd - Székesfehérvár and to 120 km/h on the densely built-in sections between Kelenföld – Nagytétény and Velencefürdő – Agárd
▪ The lack of double-track on Budapest – Tárnok section substantially reduces capacity of the whole section.	▪ Duplication of the track in the section Kelenföld – Tárnok
▪ The demand to increase the axle load from 210 kN	▪ Introduction of axle load 225 kN
▪ There exist a number of speed restrictions due to small curve radio, particularly at the entrance/exit to stations.	▪ Increasing of capacity by changing station tracks

The location is illustrated on the figure below:

Figure 1:The location of the development are illustrated on map



The preliminary design works and environmental assessment have been performed on four sub-sections as follows:

Sub-sections	Appr. chainage of sub-sections (km)	Length of sub-section (km)	Involved settlements/station or stops
Budapest, Kelenföld (inc.)– Tárnok (inc.)	05+300-25+000	19.700	–Bp.-Kelenföld –Budafok-Albertfalva –Budafok-Belváros –Növény street (new) –Nagytétény –Érdliget (demolished) –Érd-alsó –Tárnok
Tárnok – Kápolnásnyék (inc.)	25+000-43+969	18.969	–Martonvásár –Baracska –Pettend –Kápolnásnyék
Kápolnásnyék – Dinnyés (inc)	43+969-57+700	13.731	–Velence (demolished) –Velence-fürdő (demolished) –Gárdony –Agárd (demolished) –Dinnyés
Dinnyés – Székesfehérvár (excl.)	57+700-66+400	8.700	–
Total:		61.100	

In order to attain the 160 km/h speed the entry curve of several stations needs correction, the greatest track displacement is 7,00 m. On certain stops the track is displaced because of the interim platforms will be adjusted. During the rehabilitation certain structures – bridges, culverts, subways – will also be

rebuilt and new ones will also be constructed, and the drainage system will be modernized, too. Building at several stops will be demolished, as no staff will be required at those places.

The planned rail reconstruction includes the following works:

- demolition, extension, rebuilding of the earthwork,
- replacement of RC sleepers,
- replacement of crushed stone ballast,
- rail track replacement.

At most sections the permanent way is of system 60, continuous, welded execution with 60 cm spacing of the LW mark RC crosses sleepers. The reconstruction will mainly be implemented on railway area. The land need of the modernization is minimal, the occupation is limited to outer land out of agricultural use.

Traffic data for the present and future conditions envisaged on the long run can be summarized as follows:

Table 1: Traffic data for the present and future conditions

	present traffic (2005)								planned traffic (2020)						
	daytime				night				daytime				night		
	Kl-T	T-Mv	Mv-Sv		Kl-T	T-Mv	Mv-Sv		Kl-T	T-Mv	Mv-Sv		Kl-T	T-Mv	Mv-Sv
coaching traffic															
intl. EC/IC	6	6	6		0	0	0		10	10	10		0	0	0
inland IC	8	8	8		0	0	0		10	10	10		0	0	0
fast	33	33	33		0	0	0		34	34	34		0	0	0
local	54	54	33		9	9	9		68	68	42		11	11	11
overland	5	5	5		1	1	1		6	6	6		2	2	1
block train	2	2	1		3	3	0		2	2	1		3	3	0
	108	**108**	**86**		**13**	**13**	**10**		**130**	**130**	**103**		**16**	**16**	**12**
									increase in coaching traffic total 20%						
freight traffic															
Rola	1	1	1		1	1	1		2	2	2		1	1	1
TEC	2	2	2		1	1	1		2	2	2		1	1	1
Nt	5	5	5		5	5	5		6	6	6		6	6	6
Gt	5	5	5		5	5	5		5	5	5		5	5	5
direct inland	2	2	2		1	1	1		2	2	2		1	1	1
	15	**15**	**15**		**13**	**13**	**13**		**17**	**17**	**17**		**14**	**14**	**14**
									increase in freight traffic total 10%						

Kl Bp.-Kelenföld
T Tárnok
Mv Martonvásár
Sv Székesfehérvár

INTRODUCTION OF THE MAIN ENVIRONMENTAL CONCERNS OF THE PROJECT

The reason for EIA obligation of the planned project falls into the category of increasing the service capacity of an existing infrastructure. Therefore, the complex presentation and evaluation of environmental impacts of the existing railway line and present train traffic was not the purpose of the designers in EIA preparation for the planned developments.

According to the planned activities of project implementation and operation, the environmental impacts can be divided into the following groups:

Impact of construction activities – lasting for a definite period of time, the impacts of which can be felt temporarily only for several weeks/months, on the work site (area to be expropriated) and in its direct vicinity.

Impact of installation – due to new land occupation, at sections where new track is to be constructed. This impact is irrespective of the traffic.

Impact of the traffic – created directly by the train traffic: changes expected only due to the planned increase in the number of trains, therefore, significant change in impacts are limited to increased noise emission. Other envisaged impacts, e.g. discharge of collected runoff water into surface waters or lands, impacts on flora and fauna, land use, are not expected to change significantly.

Impact of the operation – generated during the maintenance and service processes – no significant changes are expected.

From a broader point of view, indirect effect can be identified in potential decrease of road traffic on the parallel main road due to the developed, favourable train transport condition. The decrease in road traffic may result in improving air quality, thus the planned development may contribute to sustainable development. However, as the main aim of the project development is not specified in environmental protection, any estimation for the quantification of this favourable effect were not required to be quantified in project preparation.

MOST IMPORTANT PRESENT ENVIRONMENTAL CONDITIONS OF PROJECT AREA

As determined in the previous section, the main impacts are generated from noise emission of the increased train traffic. Other impacts are not expected to change significantly compared to the present condition, therefore, the basic conditions of air quality, soil, surface and ground water were not needed to be determined during the impact assessment. In the following, the basic condition of noise loads along the railway line is presented as determined in the EIA documents. Nature conservation areas along the line are also presented briefly.

A.3. NOISE AND VIBRATION CONDITION

Direct impact area for noise emission is the adjacent row of houses along railway line, located at 85 - 100 m from the centerline of the new truck.

According to ministerial order No. 8/2002. (III.22.) KöM-EüM establishing noise and vibration load limit values, the limit values of equivalent A-sound pressure level resulted of the traffic noise are the followings along main railway lines:

Table 2: Limit values of equivalent A-sound pressure level resulted of the traffic noise along main railway lines

	Area category	**day (06.00-22.00 h)**	**night (22.00-06.00 h)**
1.	Holiday area, healing area, health care area, designated part of protected natural area	60	50
2.	Residential area (small town, garden city, rural, block building-in)	65	55

The reference time is 16 hours and 8 hours during the day and night, respectively.

Regarding vibration condition, the present situation was not surveyed in the course of the performed impact assessment. However, it is foreseeable that the planned reconstruction will definitely improve the vibration conditions.

A.3.1. Kelenföld-Tárnok section

The railway runs almost entirely on populated area, mostly in Budapest, District XXII. Their major part belongs to urban housing development zones, only a minor section can be classified as suburban settlement area. The nearest residential buildings are located at 15-20 m from the railway.

Detailed survey was carried out in the 120-120 m vicinity of the stretch.

During the construction of trunk road No. 6 leading along the railway line noise abatement measures taken earlier resulting in the reduction of railroad as well noise are as follows:

- Passive protection at two buildings,
- Noise barrier between sections 13+300 – 14+650 km

The present noise conditions of the impact area were determined by field survey and calculations as well. By comparing the investigation results with the limit values it can be stated that the noise impact exceeds the limit values of 65 dB for daytime and 55 dB for night.

Exceeding the limit values were found as follows:

Table 3: Exceeding the limit values at Kelenföld – Tárnok section

Side	**Track section***	**Length (m)**	**Exceeding limit values by dB**	
			daytime	**night**
Right	5+400 – 6+700	1300	0,8 - 2,6	4,8 - 7
Right	6+700 - 7+650	950	0 - 3,7	2,5 - 9,2

* The sections given here presenting the site of examination performed in the earlier phase of project development, therefore the planned locations of noise barriers may be presented in other documents need not to be exactly at the same sections.

Side	Track section*	Length (m)	Exceeding limit values by dB	
			daytime	night
Right	7+700 – 10+400	2700	0 - 8,9	0 - 14,5
Right	13+300– 16+300	3000	0 - 5,2	0 - 1,6,
Right	17+500– 18+950	1450	0	0 - 4
Right	18+950– 20+000	1050	0	0 - 1,9
Right	20+000– 21+800	1800	0	0
Right	22+100– 23+200	1100	0	0 - 0,2
Right	23+600 – 24+000	400	0	0
Length (m)		13750	7950	10650
Left	5+400 – 7+000	1600	0 - 1,2	0 - 6,4
Left	17+500– 18+950	1450	0	0 - 2,3
Left	18+950– 19+800	850	0	0
Left	21+000– 21+800	1800	0	0
Left	21+800– 23+200	1400	0 - 1,5	0 - 5
Left	23+800– 24+000	200	0	0
Length (m)		7300	3000	4450

It can be concluded from the data above that presently the impact area has minor or major noise load above limit along the most part of the section, especially at night on the right side.

A.3.2. Tárnok – Kápolnásnyék section

The railway runs on populated areas classified as suburban settlement. The smallest distance of the railway line form houses varies between 20-50 m. The noise load limit values are 65 dB for daytime and 55 dB for night.

The present noise load was calculated with SoundPlan 6.1 software, based on data of present train traffic, field survey was not carried out.

Exceeding the limit values were found as follows:

Table 4: Exceeding the limit values at Tárnok – Kápolnásnyék section

Side	Track section	Length (m)	Exceeding limit values by dB	
			daytime	Night
Right	25+000– 25+150	150	0 - 1	1 - 8
Right	25+275– 25+378	103	0	3 - 5
Right	32+250– 32+700	550	0	4 - 5
Right	35+600– 35+850	250	0	2

Side	Track section	Length (m)	Exceeding limit values by dB	
			daytime	Night
Right	42+860– 43+200	340	0	7
Right	43+200– 43+300	100	0	2
Right	43+500– 43+750	250	0	1
Length (m)		1743	150	1743
Left	25+000– 25+378	378	0	5 - 8
Left	32+300– 32+700	400	0	4 - 5
Left	32+700– 33+700	1000	2 - 3	10 - 11
Left	35+700– 37+000	1300	0	1 - 2
Left	40+450– 40+580	130	0	3
Left	40+620– 41+150	530	0	0
Length (m)		3738	1000	3208

It can be concluded from the data above that presently the impact area has noise load above the limit at night along the most part of the section.

A.3.3. Kápolnásnyék – Dinnyés section

The railway runs almost entirely on populated area of Lake Velence classified as suburban settlement, major part of which is classified as recreational area. The minimum distance of houses along the line is appr. 25 m. The noise load limit values are 65 dB for daytime and 55 dB for night at suburban settlements, and 60 dB for daytime and 50 dB for night at recreational areas.

Field survey was carried in 2004. Measuring points were selected at one section in each settlement at 25 m from the line in front of residential buildings. The noise measurement covers the noise effects of public road nearby as well, however, the noise of rail traffic is the determining in the measured noise level.

Exceeding the limit values calculated from measured values for 50 m distance from the line were found as follows:

Table 5: Exceeding the limit values at Kápolnásnyék – Dinnyés section

Settlement / sampled section	Limit exceeded by, dB (on inhabited areas)		Limit exceeded by, dB (on recreational areas)	
	daytime	night	daytime	night
Kápolnásnyék / 456+50	-	3,9	2,6	8,9
Gárdony / 496+30	-	4,8	3,6	9,8
Agárd / 538+60	-	4,6	3,4	9,6

Based on measurement results it can be concluded from the data above that presently the impact area has noise load above the limit at night along the whole section, while daytime only at the recreational areas.

The present noise load was calculated by computer model (SoundPlan 6.1) as well based on data of present train traffic. Fro the results it was concluded that the measured existing registered noise level values were higher by 5 dB than the calculated values, the reason for which is the strong wearing of the track, since due to the wear of the welded rail joints it shows the characteristics of a fished joint track. (According to National Standard No. MSZ 07-2904:1990 about the calculation of railway traffic noise, calculating 5 dB difference between the welded and fished joint tracks is appropriate).

Summarising the existing noise load along the examined railway line the data presented here shows that limit values are exceeded at most of the populated areas, more significantly at night. The main reason for this can be found:

- mainly in the worn condition of the tracks, as the welded rail joints showing the characteristics of fished joint track;
- partly in the small distance of houses from the tracks at certain locations.

A.3.4. Dinnyés – Székesfehérvár section

This section runs out of populated areas, therefore there is no buildings along this section to be protected against noise. Due to this situation the presentation of present noise condition was found to be out of interest.

A.4. NATURE CONSERVATION SITES

Along the 61,1 km length of the concerned railway section one important area of nature conservation can be found. It is the Dinnyés fertő (morass) area situated to the southeast from the Lake Velence in the fields of village Dinnyés. Its size is 539 ha, the railway track is just passing on embankment at its boarder at appr. 2 km length. The swampy area of the Dinnyés fertő is a highly valuable feeding and nesting place for the water birds of the neighbourhood. The avifauna is extremely rich consisting of a large number of birds, the area covered with reeds, bulrush and sedge. The vegetation of the Dinnyési fertő is also significant. The site is a nice example of active nature conservation, as with adjusting the lock-gate of the former draining lock the missing water is supplied. The site was declared nature conservation area in 1966. Later it was classified as Ramsar area and also belongs to Natura 2000 network.

Along the 20 km section of the Budapest-Tárnok section 3 small living sites can be identified in Tárnok area with limited, only local natural value. These are the Benta creek meadows, the Halastó (fishpond), and the Szőlőhegy (wineyard).

No other areas of significant natural values can be found on the concerned area.

Impacts on other environmental elements are not expected to change due to speed and traffic increase on the reconstructed line, therefore they were not examined.

REVIEW OF ENVIRONMENTAL IMPACTS AND EFFECTS

A.5. CONSTRUCTION PHASE

During the planned reconstruction the following works will be implemented: track replacement, replacement and building of crushed stone ballast, replacement of RC sleepers, demolition, extension and building of earthwork, and at certain places station buildings are to be demolished.

Works related to the implementation / renewal of auxiliary services (e.g. signalling) have no environmental concerns.

A.5.1. Air quality

The quality of the air is determined by the movement of machines and transport vehicles and by dust emission in connection with the construction work. These temporary effects can be minimised with appropriate execution and will be terminated with finishing the construction works.

The effect can be evaluated as tolerable due to its temporary load.

A.5.2. Soil, groundwater

During the construction repair, oil changing works of the working machines will not be made on the construction site. Would any contamination result during the construction from the possible defect of machines, it will be immediately removed by absorbing agent thus preventing pollution.

The effect on soil and groundwater is negligible, or slightly burdening in case of accidental events.

A.5.3. Noise

Temporary increased noise load can be expected from the machines working on the construction. According to the plans the building period will not be longer than one year, and will take place mostly during daytime.

The works will be performed with various machineries the technical condition of which will be maintained to keep the noise emission low enough to meet the limits.

The effect is burdening to the population living near to the construction site.

A.5.4. Nature

Railway rehabilitation will be made on the existing track line, thus in view of the existing conditions new cutting of habitat will not occur, the extent of habitat loss is negligible. The size and value of the impacted area is not significant.

The construction at section from the crossing of main road No. 7 to Dinnyés bordering the Dinnyés-Fertő Nature Conservation Area will be performed with special construction technology occupying only the track area, in order to avoid any use of areas along directly to the track line as e.g. access, deposit or borrow pit areas. The effect may be slightly burdening.

A.6. OPERATION PHASE

A.6.1. Air quality

Since the railway line is electrified, there is no emission, the movement of trains can produce only some minimum amount of dust in dry weather, so the expected effect is negligible.

However, indirect positive impact can be envisaged due to the railway traffic improvement considering that a part of road traffic will be diverted to the railway, and this will result in less air pollutant emission.

A.6.2. Soil, groundwater

Repair, eventual painting, filling with fuel and lubricant of the machines will be made in workshops and garages, serving for this purpose. During the operation harmful material can only get to the track in case of accident. For damage prevention purposes MÁV is operating a day and night emergency service, the so-called Chemical Prevention Service, with well equipped patrol car, assets and crew. The Service can get to the site quickly and can begin the liquidation, localization of spillages, contaminations and the prevention of further damages.

The so-called roller switches, used today on the stations do not require oil lubrication, thus their surrounding cannot be contaminated by oil.

In summary, no significant effect can be expected during normal operation.

A.6.3. Surface water

The line section does not affect water base, or future water base of regional importance. Nevertheless, the railway line is crossing public watercourses.

The area of the examined track section belongs to the catchment area of Lake Velence.

Main surface water recipients receiving collected run-off waters can be found only along Kápolnásnyék – Dinnyés section as follows:

Bágyom creek,

Gerja valley trench,

Gárdonyi boundary trench,

Agárdi trench,

Black trench.

In addition to the above watercourses the collected run-off water is discharged into so-called temporary watercourses at other 11 places as well.

Planned water drainage solutions: covered ditch, covered evaporative ditch, ditch with earth bed, superstructural drains for the drainage of the permanent way. Water drainage structures: culverts.

Applying technically proper solutions and design the effects can be eliminated and can even result in minor improvement compared to present condition.

A.6.4. Nature

During operation the disturbing effect of lights and noise can be expected and will increase with higher traffic.

The reconstruction of a linear facility on populated area particularly in urban environment raises no particular problems from the aspect of nature protection since on settlements the ratio of natural living places and their related fauna and flora, even their presence, is generally negligible.

Compared to the present situation no significant change can be expected neither from degradation, nor from migration point of view. Therefore, the area of the highly protected Dinnyési-Fertő nature conservation site bordered by the rail line will neither suffer significant disturbing effect.

A.6.5. Noise

For the planned increased traffic condition and reconstructed tracks the envisaged noise load – without the introduction of any abatement measure – was estimated according to the followings:

> Noise calculation of railway traffic was made according to national standard no. MSZ 07-2904-1990 on the basis of train traffic data provided by MÁV. Traffic data of main road No. 7 were determined from the official cross-sectional traffic counting publication (2004), on the basis of Road Technical Specification No. ÚT 2-1.118 about Determination of future traffic of public roads with projection method, and according to Road Technical Specification No. ÚT 2-1.302/2003 about Calculation of traffic noise. The calculations were made with the help of SoundPlan 6.1 software.

According to the calculation results the noise load at houses along the tracks will increase in the critical daytime period minimum by 2-2,5 dB up to 7 dB as a result of the planned enhanced train traffic and travel speed. The actual values are depending on travel speed and the distance of buildings from the track line. (Effect in night-time was not examined because of its lesser extent compared to daytime traffic.)

It should be noted that this increase excludes the favourable changes expected from the reconstruction of the tracks.

Considering the present detrimental noise condition of the area and the reasons for that, this impact definitely needs various mitigation measures.

MITIGATION MEASURES TO BE INTRODUCED

A.7. PROTECTION OF SURFACE WATER, SOIL AND GROUNDWATER

In the area of Lake Velence the efficiency of usual mechanical cleaning of run-off waters is not eligible to attaining the limit values, therefore prior to the discharge into the recipient so-called bio-filtration trenches will be built on about 100-120 m length. This trench type is applied recently mainly along highways (M5, M6, M3).

Biofiltration trenches serving for draining run-off waters are inhabited with plants in which the removal of suspended particles is partly due to the filtration of the plantation, as well as infiltration into soil and the settling of particles. The major part of degradation is due to microbiological activities including biochemical processes as well as sorption and ion exchange. The cleaning efficiency depends on the size, the longitudinal slope and the type of planted vegetation. Its useful lifetime may be over 20 years.

With the proper technical design of the water drainage system the water quality protection of the recipients, the prevention of environment pollution can be ensured.

A.8. NOISE ABATEMENT

According to the related regulation referred earlier, in case of the modernization of an existing transport route, if the calculations or measurements performed preceding the planned implementation confirm the excess of limit value, the noise level shall be kept at least on the experienced level, and the limit value determined in the regulation should not necessarily be regarded as requirement. However, according to the national environmental protection law, for areas effected by lasting noise impact subsequent noise protection must be provided wherever possible. Considering these two principles the noise load limit to be kept following the development are determined as follows:

- for densely populated urban areas the noise load level should be reduced to the limit values given in the order – so the planned mitigation measures should be designed for the highest noise reduction;
- for sub-urban and recreational areas the noise load shall be maintained on the presently experienced values – it means that only the excess noise load due to traffic and speed increase must be compensated by mitigation measures.

A.8.1. Noise barriers

According to the coordination of MÁV ZRt. with the local governments of the concerned settlements and the environmental authority, noise reduction shall be solved with the construction of noise barriers (walls) – wherever is possible – except at the area of Gárdony and certain sections in Budapest.

Based on the preliminary calculations presented in the EIA documents, the technical parameters (size, material, etc.) of the wall sections will be determined in detail in a later design phase.

A.8.2. Noise and vibration reduction system

At the Lake Velence region, especially on the area of Gárdony, built-in noise and vibration reduction system will be used in the railway permanent way. This means the use of so-called SODIFON box insert, that is the fixing with bonding on both sides of the rail-web, and on the top surface of the rail base energy absorption insert – rubber grains bedded into a cradle made of expanding material and using mineral filling elements. The Sodifon insert reduces the environmental noise harms, produced by the railway vehicles close to the place of emission, with the active insulation of the superstructure. The use of Sodifon box inserts is able to reduce the noise even by 2 dB.

The above listed solutions were formed in the course of communication series among the designers, the environmental authorities and the municipality of the concerned settlements. The detailed technical parameters of each way of noise abatement will be determined in the later phase of design work. The location (sections) and type of planned noise abatement measures are listed in the table attached in the *Annex*.

A.9. WASTE MANAGEMENT

Buildings at Érdliget, Velence, Velencefürdő and Agárd stops will be demolished. Wastes produced by these demolitions and track replacement will be transported to the inert waste processing plant of MÁV, where they are cut into pieces, sold for recycling or are reused on other sub-lines. The whole crushed stone ballast will be demolished, and the total quantity will be used for road construction. Sleepers to be replaced will be used partly at dirt roads on other areas, partly on sub-lines. This practice of waste disposal and utilisation are appropriate for relevant national regulations and, due to that all environmental impact of wastes can be prevented.

In the period of operation the development of hazardous wastes shall not be expected, since repair, maintenance, supply with fuel and lubricants of the machines will take place on sites specially serving and equipped for this purpose.

EVALUATION OF OVERALL IMPACTS

According to the available data and information, there is no any hindrance that would exclude the implementation of the panned rehabilitation of the railway lines in case of the completion of the necessary envisaged environmental-, landscape- and nature protection as well as water management measures.

The planned railway rehabilitation will not result any environmental harm, it does not pollute the environment, no objection could be identified to receive the environmental permit.

According to the investigations the future noise levels along to the track line will decrease compared to the present level after the rehabilitation of the track, and with the implementation of noise reduction measures the meeting of noise protection requirements can be ensured on the long run, too.

All further necessary measures are to be determined in the environmental permits and later in the construction permit to be issued by the relevant authorities. The performance of the obligations and conditions will be controlled during the construction permission procedure as well as in advance to putting into operation of the reconstructed railway line.

ANNEX

Budapest, Kelenföld – Székesfehérvár railway line reconstruction

– Location of planned noise abatement measures –

Section / settlement name	rail section		noise abatement measure/ section length, m		
			wall		SODIFON
			right	*left*	
Kelenföld-Tárnok	54+55	61+20		665	
	61+20	66+50		530	
	66+50	68+55		205	
	68+55	69+65		110	
	175+55	187+00		1145	
	187+00	191+55		455	
	191+55	197+30		575	
	201+40	204+65		325	
	218+20	221+20		300	
	221+20	224+50		330	
	224+50	226+50		200	
	226+50	231+00		450	
	231+00	231+55		55	
	238+00	239+60		160	
	245+00	250+00		500	
	54+25	71+70	1745		
	74+60	78+00	340		
	79+15	90+30	1115		
	97+50	101+60	410		
	132+50	146+50	1400		
	152+10	157+10	500		
Kelenföld-Tárnok	175+60	176+30	70		
	176+30	187+00	1070		
	187+00	194+50	750		
	194+50	199+55	505		
	200+75	204+70	395		
	214+85	216+05	120		
	220+75	221+15	40		
	221+40	231+55	1015		
	236+40	239+20	280		
	241+00	250+00	900		
Tárnok - Kápolnásnyék	250+00	253+86	386	386	
Kápolnásnyék – Dinnyés	447+00	449+00	200		
	451+50	453+70	220		

Section / settlement name	rail section		noise abatement measure/ section length, m		
			wall		SODIFON
			right	*left*	
	453+00	454+50		150	
	458+00	464+00	600		
	458+00	462+50		450	
	546+50	548+00	150		
	560+40	563+50		310	
*Dinnyés – SZékesfehérvár**	–	–			

*: No installations to be protected can be found along the section, therefore no need for any abatement measures.

In case of continuous wall sections the section partition appears where the wall height varies.

To reduce the noise on the track side, the following sections it is necessary to assemble special tape to rail (both track):

-439+69-458+50

-462+00-567+00