14TH SEMI ANNUAL **ENVIRONMENTAL MANAGEMENT REPORT** 01.01-30.06.2015

Environment Department OLYMPIA ODOS S.A.

OLYMPIA ODOS

Contents

APPENDICES

A. INTRODUCTION

Based on the Concession Agreement (article 11.2.2& 16.2), as amended and applies with L. 4219/2013 (Gov. Gaz. 269/A/11-12-2013), OLYMPIA ODOS S.A. is obliged, throughout the entire Concession Period to deliver to the Service, a semi annual environmental report. In addition to that, an annual environmental report incorporating the data of the two semi annual reports is submitted to DIPA/MEPPW. This is the fourteenth Semi Annual Environmental Management Report and covers the period 01.01.2015 to 30.06.2015.

The above mentioned semi annual reports shall be publicized on the internet site http://www.olympiaodos.gr created and maintained by the Concessionaire, in accordance with the Concession Agreement.

During the motorway's construction and operation, both the constructor as well as the operator comply with all pertinent provisions, as they are recorded in the Greek Legislation, ensuring the same for their contractors and subcontractors.

Note: all appendices of the present report have been submitted to the Special Environment Service (DIPA) of the Ministry of Reconstruction of Production, Environment and Energy, responsible for the environmental supervision of the OLYMPIA ODOS project and are available upon request.

Within this framework and as a part of its Environmental Management System, the constructor, Joint Venture APION KLEOS has developed the "Environmental Legislation Monitoring Procedure", incorporating all existing pertinent legislation and updated in case the latter is amended or updated. This procedure is communicated to all parties who are obliged to then communicated to all cooperating sub-contractors.

The work's progress of the Design-Construction Project contractual scope is notified to the Concessionaire, the Independent Engineer and EYDE/MK/EPP through Monthly Progress Reports, which are developed by APION KLEOS CJV as required by the contractual document. Table 1 below depicts the progress of the Project's works in the first half of 2015.

The benefits from the project's timely completion will reach the residents of the areas temporarily "affected" as well as all other used (visitors, tourists etc) and will positively influence all financial parameters and activities in the areas (road safety, accessibility, faster transportation of people and goods, reduced transportation costs etc).

TABLE 1 – PROGRESS OF WORKS DURING THE FIRST HALF OF 2015

G.U.	SECTION	ACTIVITY	PROGRESS
1-3 & 35	**EL-KO & PBP**	Irrigation system installation.	In progress.
		Signing installation.	In progress.
		Steel barriers installation.	In progress.
		Anti-skidding layer at Thiva I/C.	Completed.
		Finishings in MOMC building.	In progress.
4-15	**EL-KO**	Traffic Management.	Continuous process.
		Works at Toll Stations (N. Peramos, Pachi, Ag. Theodoroi)	In progress.
		Works at parking areas (Kineta, N. Peramos, Ag. Theodoroi).	In progress.
		Safety barriers installation.	Completed.
		Irrigation system installation.	In progress.
		H/M works at the motorway's open sections.	In progress.
		Planting.	In progress.
		Slope stability and restoration works.	In progress.
		Asphalt restoration works.	In progress.
		Works at EL-KO Administration building.	Completed.
16-17	**KO-PA**	Traffic Management.	Continuous process.
		Storm-protection works: Box culverts construction (L115, L120, etc). Drainage construction (8+500 – 8+800, 14+250 – 14+950, etc).	In progress.
		Retaining walls construction (R291, G110, G288 etc).	In progress.
		Bridges, Over-Passes, Under-Passes construction (A123, A133, A223, A232, K119, K121, K124, K125, B120, B126, B225, etc).	In progress.
		Toll Stations: Construction of Zevgolatio FTS building (Toll Administration Building, Tunnel. Canopy, FTS Plaza), 18+800.	Completed.
		Pavement works : PST-CDF layers construction (7+700 – 10+500, 15+100 – 15+900, 18+430 – 19+600, etc).	In progress.

		Asphalt works: 1+600 – 6+500, 7+700-10+700, 18+400-19+000.	In progress.
		E/M works at G.U. 16-17.	In progress.
18-21	**KO-PA**	Traffic Management.	Continuous process.
		Retaining walls construction (R274, R221, R222, G213, G224, G226, G242, G244, etc).	In progress.
		Storm-protection works: Box culverts construction (L204, L207, L208, L213, L220, L209, L226, L259, etc).	In progress.
		Bridges, Over-Passes, Under-Passes construction (K201, K202, K237, B204, B209, B210, B239, etc).	In progress.
		Melissi & Xylokastro Lane Cover.	In progress.
		East Derveni Lane Cover C004.	In progress.
		T7 & T8 Derveni tunnels.	In progress.
		Sykia service building.	In progress.
		Pavement works (PST-CDF layers construction & asphalt works)	In progress.
		Concrete barriers construction (N.J.)	In progress.
22-25	**KO-PA**	Traffic Management.	Continuous process.
		Earthworks / embankments at G.U. 22-25.	In progress.
		Retaining walls construction (G323, G309, G321, G591, R535, R539, R548, R560, R589, etc).	In progress.
		Bridges, Over-Passes, Under-Passes construction (K244, K247, K264, K243, K507, A513, K341, K502, K514, etc).	In progress.
		Mavra Litharia Tunnel: Left & right branch final lining.	In progress.
		Akrata Tunnel: Phase B' completion, final lining.	In progress.
		E/M building at Akrata Tunnel.	In progress.
		E/M works at G.U. 22-25.	In progress.
26-29	**KO-PA**	Traffic Management.	Continuous process.
		South & North frontal of T015 Tunnel – water drainage, if need be.	Continuous process.
		Daily monitoring of convergences displacement conducted by electronic topographical equipment in comparison with the referenced values and the warning and alarm levels at Platanos Tunnel 15 (South & North portal).	Continuous process.

		Geo-mechanical and structural monitoring of Platanos village.	Continuous process.
		Storm-protection works: Box culverts construction (L401, L402, L411, L412, L415, L416, etc).	In progress.
		Retaining walls construction (G407, G409, G412, G416, G418, G420, R406, R408, etc). Gabion walls, friction plates.	In progress.
		Tunnels: T015 left, Excavation Phase A', Excavation Phase B', East portal lining, west portal lining.	In progress.
		Tunnels: T015 right, Excavation Phase A', Excavation Phase B', East portal lining, west portal lining.	In progress.
		Lane Covers construction (Platanos, Temeni, Eliki, etc).	In progress.
		Bridges, Over-Passes, Under-Passes construction (B269, B278, A296, A297, K270, K271, K299, K298, K277, K279, K283, etc).	In progress.
		Pavement works : PST-CDF layers construction (80+580-80+990, 79+460-79+950, 89+990-90+100, etc).	In progress.
		Asphalt works: 76+640-77+000, 80+000-80+160, etc.	In progress.
		E/M works: 81+015-81+156, etc.	In progress.
30-34	**KO-PA**	Traffic Management.	Continuous process.
		Daily monitoring of convergences displacement conducted by electronic topographical equipment in comparison with the referenced values and the warning and alarm levels at Tunnel 26.	Continuous process.
		T26 Panagopoula tunnel: Southwest, Northwest, Southeast, ventilation tunnel, Tunnels T24, T25.	In progress.
		Embankments / Cuts: 90+100 - 91+300, 98+000 – 100+000, 102+500 – 109+500, 90+100-91+300, 93+300-94+100, etc).	In progress.
		Storm-protection works: Box culverts construction (L504, L571, L573, L518, L583, L532, etc).	In progress.
		Retaining walls construction (R504, R506, R070, G510, G512, G515, G519, etc). Slope stability.	In progress.
		Bridges, Over-Passes, Under-Passes construction (B303, B304, K306, K307, K309, K310, K311, K313, K337, K327, etc).	In progress.
		Pavement works : PST-CDF layers construction (90+100-91+300, 93+300-94+100, 98+000-100+000, etc).	In progress.
		Asphalt works: 90+100-91+300, etc.	In progress.
		E/M works: 90+100-95+500, etc	In progress.

Please note that on 17-12-2013 the Suspension of Works ended (in force since the start of the 2nd half of 2011), all requirements of Concession Agreement Amendment Agreement articles 12 and 13 were fulfilled and therefore this date is the Amendment Effective Date in the sense defined in the Concession Agreement Amendment Agreement.

The indicative photos below, present the progress of the project's works :

Safety works – Placement of door at the Emergency Median Opening at k.p. 43+100

M Building at Pachi Toll Station – Painting works

W/C building at N. Peramos parking area – Painting works

Painting works at MOMC Unit 1 – North part

Final lining – Waterproofing of Vault (West Portal/North bore)

A296 – Strengthening footing and constructing pilewall at M1

Construction of Toll Service Building at Nikoleika

Construction of L518

Construction of K309

Construction of underpass K305

Expansion joints at B303R

Works at O510

Tunnel T13B – East Portal

Asphalt works at k.p. 21+300 – 22+760

Bearing plate test on emergency lane

Bridge B204 – Pouring of top slab

Construction of retaining structure R274

G110 – Lining walls

Construction of EDL011L109

FTS – Toll system activities by IBI

L234 – Reconstruction of north part 2nd part

B PROGRESS OF THE ENVIRONMENTAL AGENDA

1. GENERAL

Appendix A of Annex 2 of the Concession Agreement states the Common Ministerial Decisions (CMD) and the Law comprising the Project's environmental licensing and forming the main framework for the monitoring of the progress of the Project's environmental issues.
More specifically:

1. Law 2338/1995, Thiva I/C – Elefsina Toll Station
2. CMD 126393/16.02.2007, as amended and currently applies via Decision 171503/04.11.2013 (ΑΔΑ: ΒΛ1Ψ0-Α3Γ) Elefsina – Korinthos (excluding Kakia Skala section)
3. CMD 108569/18.10.2006, Kakia Skala
4. CMD 92073/16.05.1994, as amended and currently applies via Decision 168168/15.05.2013 (ΑΔΑ: ΒΕΝΔ0-ΖΦ1), Isthmos – Ancient Korinthos I/C
5. CMD 104892/16.06.2006, as amended and currently applies via CMD 172996/03.06.2014 (ΑΔΑ: ΒΙΥ10Α56), Ancient Korinthos I/C – Patra By-Pass K1 I/C
6. CMD 16049/12.08.2013, as amended and currently applies, Patra By-Pass

Please note that the Project's Owner (EYDE/KESP/P&VE) has submitted an Environmental Study on the Amendment of the Environmental Terms Approval Decision (ETAD) of the project: "Korinthos-Patra road axis" to acquire environmental licensing both of the small-scale technical modifications which arose during the preparation of the motorway's final design as well as of the accompanying works necessary for its operation.

In the construction as well as in the operation phase, the procedures and directives for the works' environmental management are implemented by the Constructor, aiming at the in compliance with the terms and constraints of the above decisions.
APION KLEOS submits to OLYMPIA ODOS S.A. monthly reports regarding the progress of the construction related works.

Within the framework of the contractual obligations, the Constructor has developed an Environmental Management Plan (EMP) for the Project in accordance with ISO 14001:2004.

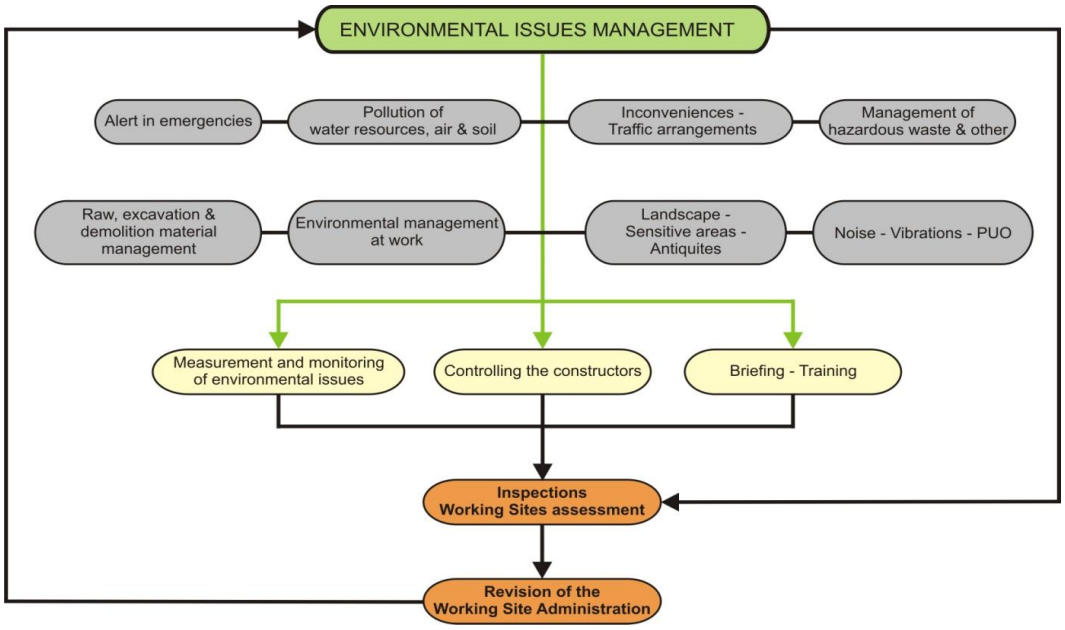
The EMP includes the organizational structure, planning actions, duties allocation, technical methods, procedures as well as processes for the development, implementation,

achievement, revision and support of the Constructor's environmental policy as well as the compliance with the Project's environmental terms.

The EMP constitutes the basic and overalll framework for the management of environmental issues, whereas the procedures and directives area tool for the rational handling/ management of each environmental issue, taking into account the pertinent legislation and the decisions applicable to each case.

The advantages from implementing the EMP pertain to the following:

- saving natural resources (reduced consumption of raw materials, energy, water etc),
- reducing the waste and by-products process and disposal cost, minimizing fines due to law violations,
- reducing insurance costs by reducing the potential risks and having contingency plans and finally
- improving the bussiness's public image, since it can effectively establish its environmental reliability.



The EMP as well as the environmental management procedures/ directives are at the disposal of the competent authorities involved in the Project.

The Operator in order to comply with the Project's environmental terms and the implementation of an Environmental Policy has developed an Environmental Management Plan for:

- controlling, monitoring and dealing with the environment impact of the project
- optimum management of liquid and solid waste of the Project
- promotion of best practices to reduce energy and resources consumption

2 PERMITS – DESIGNS RELATED TO CONSTRUCTION

In the framework of complying with the Concession Agreement environmental requirements, the approved environmental terms and the required environmental permits:

a. Requests are submitted, when required, in order for forest and archaeology related permits and official opinions to be issued.

b. Environmental Impact Study (EIS) was developed and submitted to EYPE/MEECC (acc. to L.4014/2011) in order to obtain Environmental Approval for the requested Borrow-pits – Quarries & Deposit-pits for the completion of the KO-PA section's construction. The approval process was completed with the issuance of a new ETAD (ADA : BIY10-A56) titled : "*Korinthos-Patra road axis, upgrading the existing road into a motorway", regarding the additional quarries and borrow-pits sites in Korinthia and Achaia Pref. for the motorway's construction requirements*.

Please note that :

1. For the above lands and where required, the development/approval of the Technical Exploitation Designs is under way,
2. Geotechnical reports have been prepared confirming that there are no disturbed areas among the proposed sand-extraction locations,
3. The respective delineation designs have been approved for the proposed sand-extraction locations and
4. Based on DCC article 21.3, the Concessionaire asked EYDE/MK/EPP to deliver to the Constructor the Vacant Possession and relevant Rights of Way of the above approved additional lands.

Based on the above, during the first half of 2015 the Peloponnese-W. Greece-Ionion Decentralised Administration granted four (4) permits for sand extraction from Krathis, Foinikas, Meganitis and Selinountas rivers. Also, the Technical Study was approved for the Operation of aggregates quarry in "Agrilitses", Mun. of Korinthos.

a. Cooperation is in progress with the Public Utility Organisations in order to relocate various networks located within the Project.

b. Hydro geological Design (*AQUATERRA - Ch. Kapopoulos - E. Psarropoulou & Co*) has been submitted to the competent Public Service. The above pertains to the excavation of seven (7) new water collection works, so as to cover the irrigation,

fire fighting and other needs that shall arise in the Project's short-term parking areas along KO-PA section.

s/n	Name	K.P.
1	EL-KO 1	5+650
2	KO-PA 1	16+850
3	KO-PA 2	28+750
4	KO-PA 3	39+150
5	KO-PA 4	62+700
6	KO-PA 5	87+300
7	KO-PA 6	111+100

The following studies were submitted to DIPA/YPAPEN (either directly or through EYDE/KESP/P&VE) for environmental licensing:

- For the installation and operation of steel reinforcement process worksite in Akrata
- For the creation and operation of borrow-pit at “Soussana”, Athikia, Mun. of Korinthos
- For the installation and operation of infrastructure and support worksite at “Chondra Litharia”, Mun. of Xylokastro - Evrostini.

c. EYPE/MEECC (now DIPA/MEECC) approved the Technical Environmental Design (TED) for the installation and operation of Platanos worksite (No 148405/30-4-2015].

d. Within the first half of 2015, TT& E S.A. has completed the preparation of the Final Special Acoustic Designs for the Calculation and Implementation of noise barriers for KO-PA section determining the following locations where noise-barriers must be promptly installed.

3 ENVIRONMENTAL PARAMETERS MONITORING PROGRAMME (NOISE MONITORING, TRAFFIC LOAD VIBRATIONS, AIR QUALITY, WATER)

During the construction of the project as well as for its operation, a thorough Environmental Monitoring System is applied.
By this programme, environmental parameters such as noise, water and air quality, waste, natural resources , sensitive areas etc. are monitored.

I. Traffic Noise and Vibrations

- Existing Sections (EL-KO & PBP)

Sound barriers: Following the "Special Acoustic sound barriers design" approved by EYPE/MEECC via document No 122052/8.3.2010 which also determined the barrier type to be used, the barriers' installation along the Project's existing sections started and is for the most part completed. Their installation is foreseen to be completed within the EPD set by the Concession Agreement.

oise Barriers locations at PbP

More specifically, taking into account the aesthetic/architectural requirements and the restrictions imposed by the constructions' static adequacy and road safety elements, the barrier surfaces created with transparent sheets used as much as possible are obviously not making the residents of the areas behind them feel "caged".

The barriers' formulation was based on the following architectural design principals:

- Selection of the proper dimensions for the vertical walls and combination with the transparent panels they support so as to achieve the best possible proportion of transparent and non-transparent parts of the overall barrier superstructure.

- Use of horizontal scotias on the narrow walls (they facilitate the wall's visual integration into the natural environment by breaking up its surface while also being compatible with the vehicles' horizontal direction).

- Alternation of walls and transparent panels so as to avoid – to the extent possible – a monotonous repetition of one single pattern.

- The reinforced concrete non-transparent panels have been placed with proper width variation so as to give a sense of varying degrees of density. This is done in an attempt to distract the viewer from any single part of the construction and make him/her see the whole picture.

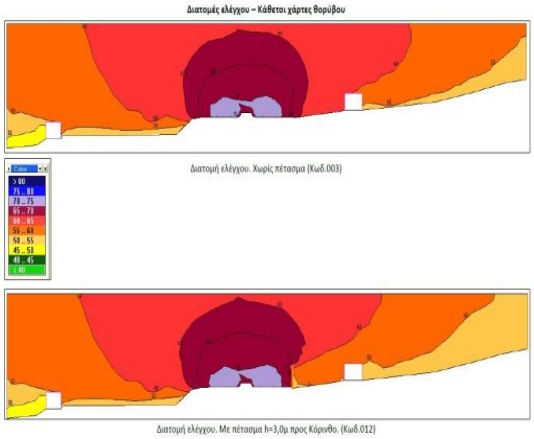
Please also note that protective measures have been taken to prevent birds from crashing on the barrier's transparent parts. To that end, suitable bird images have been stuck on the panels following the successful methods used in other similar cases.

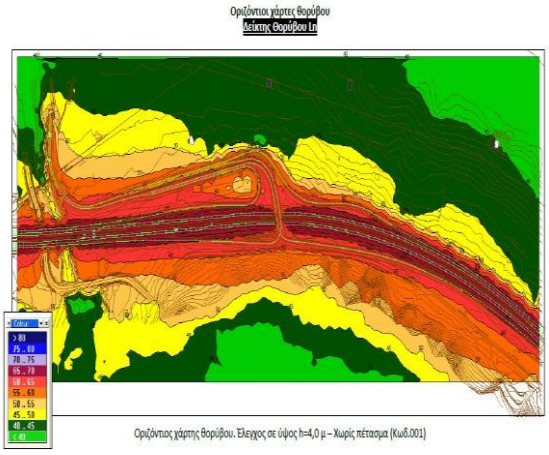
Stickers are the most widespread method in Europe since it requires no a priori selection of potential sections to paint. Rather, one can a posteriori apply the stickers on the locations where birds are establish to fly and hence there is a risk of them crashing on the panel.

Note that EYPE/MEECC approved the "Supplementary Special Acoustic Noise Protection Design and Special Noise Barriers Design" for "Elefsina-Korinthos" section, pertaining to the protection of "Isthmos Bridge" settlement in Loutraki – Perachora Mun., Korinthia Pref. (Decision No. 110987/6-5-2015).
Thus, the installation has commenced of the noise barriers proposed by the design in this area.

- New Sections (KO-PA)

Along the Motorway's new sections and within the framework of preparing the "Special Final noise protection Design & Special noise barriers Design" acoustic measurements were conducted to register the current traffic noise conditions (*TTE Environment S.A.*) for "Anc. Korinthos I/C – K1 Patra By-Pass I/C" and Rio-Antirio bridge road accesses. The design, which will also determine the barrier type to be used, was completed within the 1st Semester of 2015.





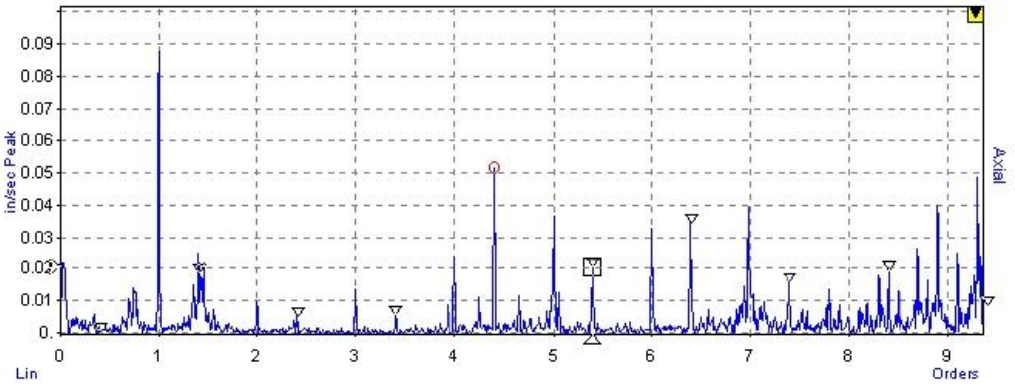
According to the afore mentioned study, the locations where sound barriers will be installed are the following:

SOUND BARRIERS LOCATIONS				
SOUND-BARRIER		BRANCH	MINIMUM LENGTH	BARRIER HEIGHT
from K.P.	to K.P.			
7+822,5	7+956,5	to Patra	134	3.0
20+566,5	20+796,3	to Korinthos	230	3.5
26+804,2	26+866,2	to Patra	62	4.5

26+059,0	26+231,5	to Korinthos	172	4.5
26+524,2	26+705,0		182	4.5
91+440,0	91+623,7	to Patra	184	3.0
91+816,7	91+943,8		128	3.0
96+183,6	96+259,6	to Patra	76	4.0
96+957,5	97+017,5	to Korinthos	60	3.0
97+192,6	97+424,6	to Patra	232	3.0
97+772,5	97+831,5		58	3.0
97+104,9	97+254,9	to Korinthos	150	3.0
98+852,6	98+964,9	to Patra	110	3.0
98+710,9	98+797,0	to Korinthos	88	3.0
107+843,6	107+990,6	to Korinthos	144	3.5
111+590,9	111+713,9	to Korinthos	122	3.5
111+794,9	111+879,0	to Patra	84	4.0
111+879,0	111+968,2		90	3.0
111+713,9	111+922,1	to Korinthos	208	3.5
112+825,9	112+889,3	to Patra	66	3.0
114+555,8	114+681,7	to Korinthos	126	3.0
114+770,5	114+852,4	to Korinthos	82	3.0
115+353,1	115+429,2		76	3.0
115+676,6	115+721,1		44	3.5
115+701,7	115+769,3	to Patra	68	3.5
115+769,3	115+883,4		114	3.0
115+721,1	115+841,4	to Korinthos	120	3.5
116+746,1	116+812,0	to Patra	66	3.0
118+006,6	118+190,5	to Patra	184	3.5
117+484,3	117+558,6	to Korinthos	74	3.5
117+547,5	117+773,7	to Korinthos	226	3.5
118+137,9	118+237,4	to Korinthos	100	3.5
118+190,5	118+362,9	to Patra	172	3.0
118+67,1	118+767,1	to Patra	110	3.0
118+237,4	118+327,2	to Korinthos	90	4.5

Please note that the noise barriers proposed in the Designs will be of the same type which have already been approved via EYPE/MEECC's document No 122052/8-3-2010 and constructed along "Elefsina-Korinthos" and "Patra By-Pass" sections.

Vibrations : During the Project's execution, due care is given to minimise vibrations caused by the construction activities to buildings and sensitive locations within the Project's zone of influence.



To that end, the installation is foreseen – at critical points – of measurement and recording systems of all significant variables of the phenomenon (soil movement, speed and acceleration). The local working sites will keep complete records of the recorded data.

In parallel, the Operator carries out traffic counts at the Project's toll plazas. More specifically, each month the company drafts an operation report, including precise traffic data, i.e. number of vehicles passing through all toll plazas and the traffic composition; said report is duly submitted to the competent supervising Services of the Ministry of Economics, Infrastructures, Maritime Affairs and Tourism. The company has at its disposal both the primary and the processed traffic data.

II. *Monitoring of air quality & basic meteorological data*

Complying with the Concession's Agreement environmental requirements, the relevant technical specifications were determined referring to the procurement, installation and commissioning of two (2) permanent Air Quality & Meteorological Data measurement stations to monitor the impact of the motorway on the wider region.

Station at Tripoli Semi-I/C

Station at Glafkos I/C

The environmental stations coordinates are the following:

Location	Latitude	Longtitude
TROPOLI SEMI-I/C	37°55'6.49"B	22°54'28.38"A
GLAFKOS I/C	38°12'13.34"B	21°46'16.88"A

- The station at Tripoli Semi-I/C (to be installed shortly) will monitor the impact upon the town by the operation of the new motorway .
- The station at Glafkos I/C along PBP has been completed and set in operation in Devember 2014. The point at the south end of the PBP receives all pollution from toad usage and seems to be a good indication of the pollution caused by the motorway while also reflecting the pollution from the motorway accesses.

The parameters measured at the stations are the folllowing:

The environmental station at Tripoli Semi-I/C

Station	Suspended particles PM10 & PM2.5	CO	NO NO2 NOx	SO2	O3	BTEX
Korinthos	x	x	x	x	x	x
Glafkos	x	x	x	x	x	x

The following meteorological parameters are also cited:

- Wind direction and speed
- Atmospheric rtemperature and relevant humidity
- Sunshine
- Precipitation

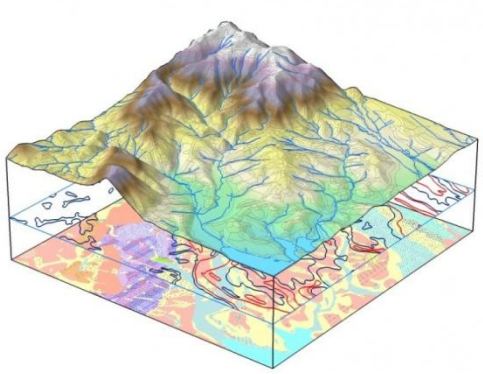
To measure pollution, the stations have been equipped with analysis devices approved under the National Law (CMD Η.Π. 14122/549/Ε.103/2011 (Gov. Gaz. 488/Β`/30.3.2011) Measures to improve air quality, in accordance with guideline 2008/50/EU ”on the air quality for a cleaner atmosphere in Europe” of the European Parliament and the Council of Europe on May 21st).

The Glafkos environmental station

Appendix 5 of the present report includes the Air Quality Report for the 1st semester 2015 Regarding Patra Station, it includes data for the whole 1st semester 2015, whereas regarding Korinthos Station, it includes data only for the period April - June 2015.
It is noted that as to the monthly, daily and hourly alteration of the pollutants, there was no noteworthy remark, whereas regarding limit values there was:

- only one exceedance of the maximum ozone value within eight hours at Korinthos station, which should not exceed for more than 25 days per calendar year on average, in 3 years period,
- maximum average daily value of AS10 has been exceeded 6 times in Patra (out of which 3 at least do not relate to the project operation, but to a natural phenomenon (African dust) and once (1) in Korinthos; this value should not exceed for more than 35 times a year.

III. Water resources management



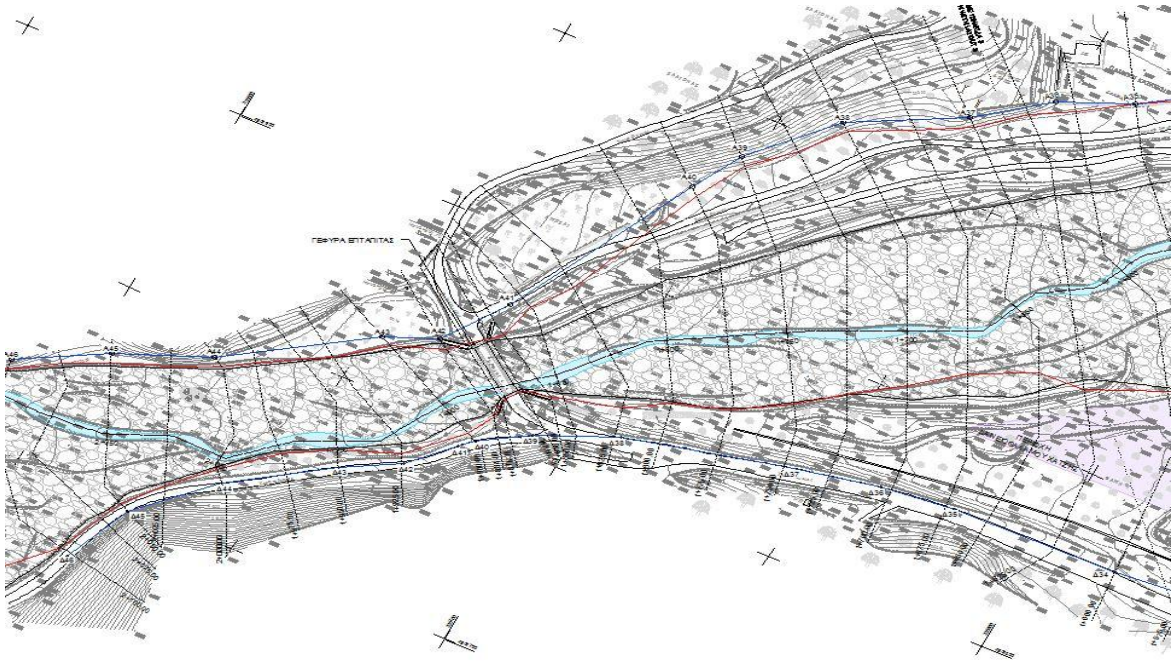
Towards enforcing article 5 law 3010/2002 (as amended via L. 4258/2014 and currently applies) and in accordance with the provisions of article 11.2.1 of the Project's Concession Agreement, the CJV proceeded in the elaboration of stream delineation designs (*D. Sotiropoulos & Co*) for the

stream's section extended along the Projects construction zone or abutted to it and along Korinthos - Patras section for five hundred meters downstream excluding the cases where downstream to the Road Project and up to 500m. HSRL/OSE structures exist or another delineation is in place. The designs have being submitted to the Technical Services of the local Prefectural Administrations for approval and any other administrative act necessary in order to be rendered fully effective.
In the 1st Semester of 2015 the following Gazette Sheet was issued ratifying the delineation determination along KO-PA section:

1. Meganitis "Chatzis" river Gov. Gazette 120/Δ/6-5-2015 (sand extraction).
2. Selinountas "K. Mavriki" river Gov. Gazette 132/Δ/28-5-2015 (sand extraction).

Please also note the Deemed Issuance of Krathis & Foinikas rivers partial Delineation (sand extraction points) by EYDE/KESP/P&VE via documents No ΕΠΠ/Π1/Φ.4/8301/27-10-2014 and ΕΠΠ/Π1/Φ.4/8302/27-10-2014 respectively.

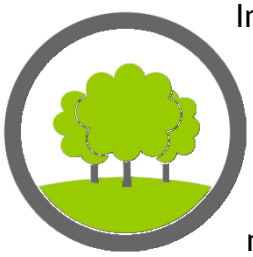
The delineation designs for the rest KO-PA section's streams are under way.



Hydro geological Design (*AQUATERRA - Ch. Kapopoulos - E. Psarropoulou & Co*) has been submitted to the competent Public Service. The above pertains to the excavation of seven (7) new water collection works, so as to cover the irrigation, fire fighting and other needs that shall arise in the Project's short-term parking areas along KO-PA section.

4 ENVIRONMENTAL MITIGATION MEASURES DURING CONSTRUCTION

a. Geomorphology - Soil



In order to protect the soil from fuel leaks etc special areas with sealed floor and graded collection drain that ends in a sedimentation basin are provided in order to swill the machinery.

In the machinery maintenance or in other suitable and safe area, used oils from black oils change are temporarily stored. The management of the used oils is in accordance with the provisions of PD 82/2-3-2004. By the PD is given priority to collect and dispose used oils for regeneration treatment.

All necessary measures are taken in order to avoid erosion or filtration at the slopes during the tunnel construction and the water and clay supply to the final acceptor. The sediment before being disposed is being treated in apposite sedimentation tanks.

b. Geology

Special attention shall be paid during construction of sections passing by geologically sensitive zones, as in those areas stability problems might emerge at the formations. In those sections shall intervene as little as possible.

c. Ecosystems - Vegetation

In the areas where the technical structures are constructed, and mostly in the areas where bridges are constructed, all the necessary precaution are taken in order to avoid any impact on the riverside ecosystems. All possible efforts are made in order to use the fewer possible quantity of concrete. Where possible the use of gabions is preferred and the proper application/use of additives (e.g. betonite), which are used in order to add improved features to the boring effluents during the borings.

Especially during the dry period, in the construction phase, all the necessary measures are taken in order to avoid dust emissions (infusion of earth materials, trucks' load covered with nets).
In some case the cleared vegetation originated materials are cut and temporarily stored in mounds in order to create organic fertilizer for future use in planting technical activities. After clearance, excavation, collection and temporary disposal of the superficial fertile soil layer follows.

d. Mitigation measures for the improvement of air quality during construction

During the Project's execution aerial pollutants are released and especially dust from the working sites. Depending on the distances from the nearest buildings (e.g. residencies) they could have adverse implications. This dust release is dealt with (by the local Working Sites) with great success by use of the following measures.

Control of the dust release is affected through simple management methods and the impact level greatly depends on the control measures applied at the source as follows:

- Sprinkling and often – effective clearing of routes within the site and the excavation areas,
- Interventions at the work surface – front where necessary, focusing on the excavations,
- Rain-water run-off to prevent particles from re-entering the atmosphere,
- Maximum speed limits along all non-asphalt-paved surfaces,

- Along the routes of the road building vehicle, the usual control methods are applies in the case of non-asphalt-paved routes ie, asphalt paving where feasible, stabelised pavement infrastructure, water soaking and traffic regulations (*aiming to reduce dust in the dry season and traffic-indiced erosion in the wet season)*,

- Sprinkling during transfer and deposit of sand, aggregates or/and excavation materials significantly reduces released dust,
- According to greek law, all trucks transfering loose materials (e.g. excavation products) are covered. The vehicles entering or leaving the working site are clean.
- It is forbidden for the trucks to pass through settlements during quiet hours,
- Liquid rather than dry concrete is used in the mixing and preparation,
- All machinery and equipment used in works are in good condition and fulfill the manufacturer's specifications, thus minimising dust release.

Combined, the above measures comprise the so-called Best Management Practises. Given that:

- it is a linear project with many construction activities being conducted in parallel and now fast-track under the extremely tight completion time-schedule,

- the water resources available along the Project during summer season are limited,

any impact after the above measures are deemed slightly negative with a very short-term effect and can be dealt with.

In any event, the local Working Units are conducting PM10 Dust Measurements under standardized ELOT EN 12341 method, with a certified sampler, by a certified firm.

During the measurements, the motorway's construction activities are conducted normally. Each measurement lasts 24 hours and runs through one calendar day so that the findings can be directly compared to the maximum rates / target aims set by the current legislation.

Atmospheric PM10 measurements are covered by the current Official Implementation Field of Certification (No 329-3). The methodology to estimate suspended particles has a certified accuracy measurement and it provides a full depiction of the pollution's changes over time along with a good mapping of an area's pollution levels.

The measurements findings reports can be found at the local Working Units' offices while they have also been copied to the Project's Independent Engineer.

5 VEGETATION – PLANTING - ROAD CLEANING

The vegetation and planting pertain to the environmental integration and protection of the areas adjacent to the project.

- Existing Sections

In order to facilitate the fulfillment of the above obligations, a Final Planting Design (*S. Voutsinos & Co*) for the surrounding areas, the respective I/Cs, slopes and median strips was developed for Elefsina – Korinthos section. This design was approved by the project's Independent Engineer. The planting process is foreseen to be completed according to the approved works time-schedule.
The planting of Patra By-Pass is in very good shape due to the "recent" construction and maintenance for the last period of time.

Current state of PBP

- New Sections

In order to facilitate the fulfillment of the above obligations the cjv conducted a relevant tender in order to find the suitable designer (agriculturalist, landscape architect) for the elaboration of planting-technical design for Korinthos – Patra section.

Based on the tender's results the designer (*Klea Volovini*) was determined.
The planting-technical design's scope is the preparation and submission of the planting design necessary for the proper and full construction of the "Korinthos-Patra Motorway".

The Planting-Technical Design is prepared according to the Design Investigation Standards (DIS).

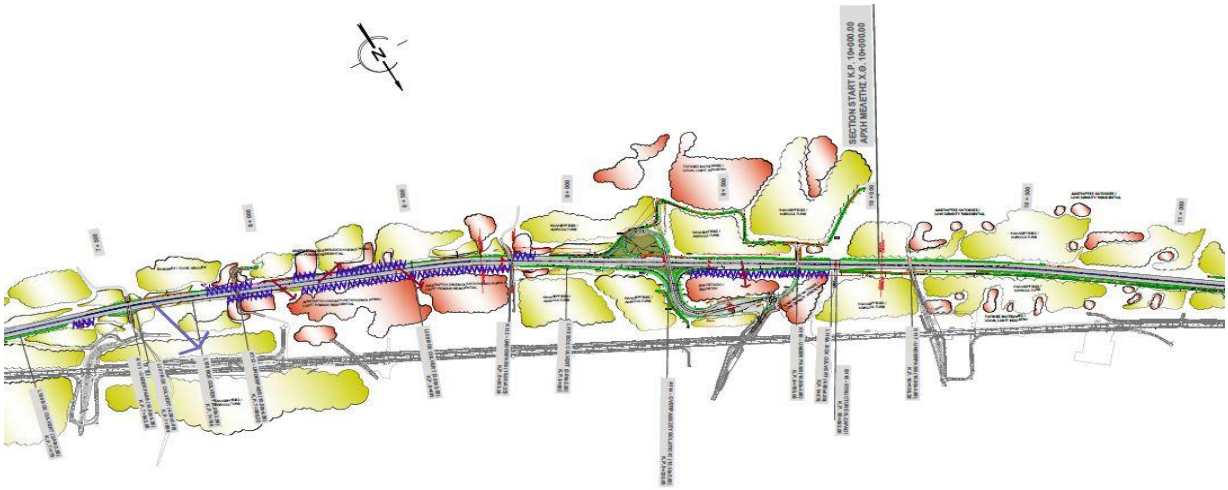
It aims at describing the prevailing conditions on site and the nature of the problems which have arisen due to the road's construction. The proposed planting interventions aim to the best possible restoration of the damages caused to the landscape by the Motorway's construction.
The planting is designed with the main target of adjusting the new plants to the existing vegetation. Trees and bushed are planted taking into account the volume they will take at the final stage of their development.

The proposed planting takes into account the following fundamental principles:

- Traffic safety
- Planting – landscape relationship
- Road equipment

During the arrangement of the various greenery (medium, high) to be planted, the following is taken into account:

- ensuring the area's unobstructed function
- the area's general and specific ecological conditions
- the area's aesthetic requirements
- creating natural continuity of the area's flora.



The species to be planted are selected based on the following:

- Their properties (final dimensions, hardwood, evergreen, flowering season, flowers colour etc.)
-The area's ecological data
- The functional aim they are intended to fulfill (decoration, soil retention, groups, growth etc.)
- The local micro-climate
- Ensuring aesthetic harmony and biological equilibrium between the species comprising the groups, growths etc.
- The dimensions of the area and each separate location
- The species' market availability
- The species' locality and that they represent the surrounding area.

Cut & embankment planting standards

The OLYMPIA ODOS OPERATION S.A. (Operator) personnel and the competent subcontractors carried out regular trimming, weeding and cleaning works for the most part of the project, and specifically of 97 km of central reserve, 402 km of shoulders and of the 28 interchanges and their branches, as well as of the 45 parking areas.

For green maintenance works the Operator has entered into contract with the following subcontractors:

- TOMI (District 1)
- J&P AVAX (District 2)

<u>Cleaning</u>
During the 1st semester of 2015, the Operator's personnel in collaboration with external subcontractors carried out and still does regular cleaning works along the entire project (202 km), in the 28 interchanges, the toll stations (lanes, booths, pavement, surrounding area, buildings), in the tunnels and in the 45 parking areas (washing, sweeping, waste removal from bins and surrounding areas).
It is noted that cleaning pertains to the entire cross section until the expropriation limits.

6 WASTE MANAGEMENT, HAZARDOUS AND NON HAZARDOUS MATERIALS

During the motorway's construction and operation, both the constructor and the operator as well as the cooperating contractors and sub-contractors comply with all pertinent provisions, according to the Greek Legislation. Joint Venture APION KLEOS in the frame of its Environmental Management Plan has developed procedures for the management of waste.

The respective "Hazardous Materials Selection and Procurement Procedure" has been prepared describing all the constructor's actions contributing to the prevention of the uncontrollable use of hazardous materials during the Project's construction period.

During the construction and the operation of the project, waste of any nature is managed based on the pertinent legislation and the constraints/ requirements imposed by the approved environmental terms, both for the Project's existing and new sections. The respective "Waste Management Procedure" has been prepared for the management of waste, documenting the existing legislative framework and the means/ directives for their management.

The respective "Water Resources Management Procedure" has been prepared for the management of water resources, presenting in detail all the constructor's actions contributing to the minimization of the adverse impact the construction has on the adjacent water resources.

Nea Peramos OMC

Nea Peramos OMC

Kiato TB

Akrata TB

Patras OMC

The results of the Project's environmental performance, such as material recycling, mineral oil, batteries, vehicle tyres, hazardous materials, polluting substances, area restoration, excavation and demolition products etc management are presented in Appendix 4 of this Report.

7 MANAGEMENT OF EXTRAORDINARY INCIDENTS, ENVIRONMENTAL ACCIDENT, GREEN AREAS FIRE

During the operation of the working sites, all fire prevention measures are taken in order to prevent fire coming potentially from working machinery, working teams, transportation of explosives and to minimize the danger of fire being expanded to adjacent areas. The way according which the fire belt is organised, was controlled and approved by the competent Fire Service before the beginning of the works.

More specifically, fire management measures are taken in order to protect forest areas on both sides of the road.

In order to assess the condition of the vegetation and the validity of the anti forest fire measures undertaken, the Concessionaire had again this year contracted a study to an expert forester. From this study it is clear that the interventions made during the last years as well as the regular green maintenance routine carried out by OLYMPIA ODOS OPERATION S.A., in combination with the extended works in progress along the road, have minimized the forest fire risk along the forested areas from which the project passes through.

Within the framework of developing the fire hoses designs along the EKPPT motorway, maps were prepared depicting the forest land for “Elefsina – Korinthos”, “Ancient Korinthos I/C – Patra By-Pass K1 I/C”.

In the framework of road safety, the Operator has Patrollers and Intervention Teams patrolling the Project with specially marked vehicles dealing with incidents (immobilized vehicles, accidents, traffic problems etc.) by implementing temporary signage to safely arrange traffic and assist the emergency services (Police, Fire Brigade and Paramedics). In this framework, 1st semester of 2015:

- 1,960,907 km were travelled by Patrols and Interventions teams (about 10,834 per day) for supervising the road network

- 11,593 incidents were managed with the Company's assistance, as indicatively: 5,535 immobilized vehicles (mechanical failure, flat tyre, out of fuel, abandoned), 4,966 obstacles on the pavement, 597 road accidents (15 with injured and 582 with material damage, 316 problems with users (pedestrians, contra flow, non authorised users, dangerous traffic violations), 54 traffic congestions and 125 other emergency incidents (fire, adverse weather etc.), of which:
    - 7,103 were delt with immediately by the Company, as they were detected by company or subcontractors vehicles.
    - 4,490 incidents were handled within 12' in average by the Company, since they were otherwise detected (phone, cameras etc.), while regarding the response of the subcontractors respectively: 18' for light vehicles and 32' for heavy vehicles

Patrol vehicles

The Operator's competent personnel (Intervention Teams) implement on a daily basis temporary signage for incidents and for the safe execution of works carried out on the road either by the Operation Company or the Construction Joint Venture. Regarding Korinthos-Patra NNR special attention is paid due to it features (no central reserve) and the sections with steep turns and limited visibility.

The Operator has action plans related to the protection of the environment either within routine maintenance or emergency and abnormal situations.

B.1 Congestion
B.2 Road Accident
B.3 Immobilized vehicle
B.4 Problem on the pavement
B.5 Problem on infrastructure or equipment
B.6 Problem with user
B.7 Other emergency incidents
B.8 Adverse weather conditions
B.9 Large scale incident in tunnel
B.10 Incident on Korinthos-Patra NNR

The Constructor shall work and cooperate closely with the Environmental Service and other departments of OLYMPIA ODOS S.A. in the application of the procedures – directives for the management of such issues.

8 ANTIQUITIES

Under the principle that cultural heritage and antiquities along the motorway shall be protected, a principle that constitutes prerequisite for the construction of the road, the Constructor has direct contact and collaboration with the competent archaeological services. According to the Concession Agreement and the Design – Construction Contract, Construction Joint Venture is responsible for the execution of archaeological investigations pursuing a recommendation by the pertinent archaeological service.

Works in the positions indicated in the Concession Agreement (article 13.1) and where there is a great potential of Antiquities being revealed have commenced.

Aerial photograph of Archaeological Site of Goddess Dimitra (tunnel T13A)

The Appendix 3 of this report presents detailed information / actions taken to protect antiquities and photographs.

9 TRAINING – AWARENESS RAISING

Environmental training aims to reinforce knowledge and raise awareness about the environment, to develop the necessary skills, to form the right behaviour, to activate and make informed decisions and responsible actions.

The Construction Joint Venture is organizing training and briefing seminars whereas all internal inspections are accompanied by the training and briefing of all competent persons at working sites regarding issues and developments pertaining to the environment.

Each working site's environmental engineers are regularly organising meetings with all parties involved in the Project's construction, providing them with the suitable training and briefing.

The Construction Joint Venture's Environmental Department in cooperation with the project engineers conduct regular inspections, give the necessary instructions or directions pursuant to the Project's EMP regarding any arising environmental issue. To fulfill that goal, special reports are developed documenting the test results, proposing measures to deal with any environmental issues identified and accompanied by a complete photographic survey.

Environmental training during the Project's construction is divided in 2 categories. The first one pertains to the specialized environmental training of the staff related to the Project's environmental management (environment engineers, foremen in sensitive areas) and the second one to the general environmental training of the whole staff. Table 3 describes the whole number of hours (persons x time) for environmental training during 01/01/2015 – 30/06/2015.

TABLE 3	
TRAINING TYPE	TRAINING TIME (HOURS)
SPECIALISED TRAINING	45
GENERAL TRAINING	25