



Trans Adriatic  
Pipeline

EPC Onshore Pipeline  
GREECE Lot 2 & 3



**IPLOCA**  
INTERNATIONAL PIPE LINE & OFFSHORE  
CONTRACTORS ASSOCIATION

## ENVIRONMENTAL - SOCIAL & CULTURAL HERITAGE MANAGEMENT ON TAP PROJECT





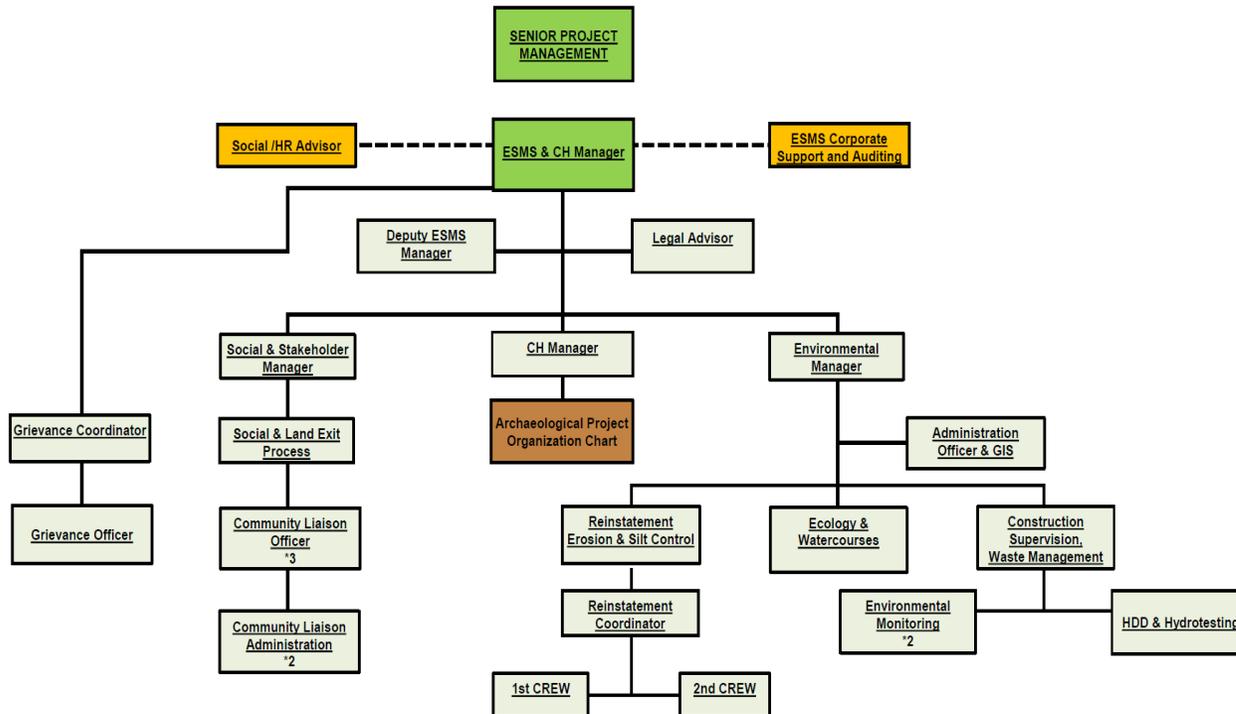
## TAP Project



- The pipeline within **Greece** (Sections 1, 2 & 3) is approximately **550 km long (48 inch Ø)**, from Kipoi near the **Turkish-Greek border** until the Greek **border with Albania**, south-west of Ieropigi. It includes with **one Compressor Station in Kipi (GCS00)** including metering facilities **and 23 BVSs** (Block Valve Stations), spaced at a maximum of ~30 km along the pipeline, including a **scraper station at BVS11**.
- The TAP pipeline route crosses a total of **13 Regional Units**: Evros, Rodopi, Xanthi, Kavala, Drama, Serres, Kilkis, Thessaloniki, Imathia, Pella, Florina, Kozani and Kastoria.



# ESMS Organization Chart



□ ESMS Department

- ESMS Team:
- 28 full time personnel during construction peak (summer 2017)

### Personnel Breakdown per Field of Expertise :

- Architectural Engineers
- Civil Engineers
- Environmental Engineers
- Chemical Engineers
- Forest Experts
- Ecology Experts
- Social Experts
- Legal Advisors

### **Total:**

- ✓ **18 Experienced Engineers**
- ✓ **8 Environmental & Social Experts**
- ✓ **2 Legal Advisors**



## Environmental Awareness

ECONEWS – December 2017

Training



- ESMS Induction Training provided to 1204 new employees.
- Bear Training and education material delivered to 174 employees at Kastoria region.
- First ESMS Stand Down held on 05/05/2017 and the second one is scheduled within January 2018.
- ESMS Bear Habitat Areas and TBT Training Session was successfully conducted on Wednesday 13.12.17 at Camp 07 with the participation of 13 Foremen.



Environment Dpt of ESMS Tel 2394309045

### Awareness Material - Exhibit 1:

#### Econews

- Monthly digitally distributed publication informing about hot environmental topics & critical areas where project is unfolding each month



# Environmental Awareness



ECONEWS - September 2017

ESMS Environmental Awards



Every month the best environmental performances receive an award!!!

- All members of the Environment Dpt. vote for the foreman with the best environmental performance.
- At the end of the year, the three best foremen will take award in special event.
- Top soil handling, Waste management, Erosion and Silt Control, Ecology Issues, TBT for Env. Issues and cooperation with the members of ESMS



Environment Dpt of ESMS Tel 2394309045

## Awareness Material - Exhibit 2:

### Environmental Awards

- Rewarding compliance and initiative to safeguard Environmental Commitments of the project - monthly

KATSIGIANNIS ZACHARIAS

CERCABENE MARIO

## ENVIRONMENTAL AWARDS

SEPTEMBER 2017  
BEST ENVIRONMENTAL PERFORMANCE

KOUTLAS CHRISTOS

- KATSIGIANNIS ZACHARIAS: KASTORIA LOT 3 ENVIRONMENTAL PROTECTION MEASURES
- MARIO CERCABENE & KOUTLAS CHRISTOS: SUCCESSFUL APPLICATION OF ENVIRONMENTAL COMMITMENTS AT PHILIPPI 9 WATERCOURSE CROSSING

# Environmental Awareness

TO ALL EMPLOYEES

**ENGLISH VERSION**

**SUBJECT: WASTE MISMANAGEMENT ON SITE**

We hereby inform that several occurrences of bad waste management have been witnessed on site during the last months.

This is absolutely not acceptable and needs to stop immediately, with special attention paid at all sensitive areas with presence of bears and wolves. Waste attracts wildlife causing a high risk for the health & safety of all working personnel.

Each crew supervisor is responsible and accountable for the correct management of the wastes and for the collection and compliant disposal of the waste at the end of each working day.

Any further case discovered on site will be severely sanctioned in accordance with the Discipline Procedure, which can lead up to dismissal from the Project.

Best regards

ROBERTO BONI – Project Director



Memo-Waste management

NO	DESCRIPTION	EXAMPLE
1	Most snakes are not dangerous. Many types of snakes (Viperas) are considered to be a pest that affects humans. Do not touch any snake without being well informed.	
2	Do not kill animals and do not try to touch them. If you see any of them notice the color, size, and type of prints.	
3	Keep the work area clean, daily remove the rubbish and don't leave food leftovers. Always use proper rubbish management procedures and environmental protection.	
4	Follow carefully the instructions of the HSE (Safety, Health etc.). In case of bites, immediately call emergency assistance and ER. Remember: Do not touch any snake, even if you are a professional or an experienced one. Do not touch any snake.	
5	Snakes prefer to hide under rocks, woods, waterfalls. Do not touch any snake and do not touch it. Take care when moving in the area of the snake. Do not touch any snake when lifting material. Do not touch any snake when lifting material. Do not touch any snake when lifting material.	

Notification-Snake issues



Notification-Snake issues

**Awareness Material - Exhibit 3:**

**Environmental Memos & Notifications**

- Raising awareness on environmental topics & critical areas where project is unfolding each month



Stand Down–January '18

ECONEWS – January 2018  
Waste management



- Waste and especially food remains must be collected and removed from the construction sites daily.
- No food contained, biscuits, antiseptics, oils and hydrocarbons inside the vehicles.
- All project areas, shall be completely kept clean of all materials and waste.
- All work crews to collect throughout the day, any materials that could be poisonous or a choking hazard to animals.
- Windows and other access points into engine compartments on motorized equipment will be kept closed and locked.

Econews–January '18

ECONEWS – February 2018  
2nd ESMS-CH Stand Down



- 81 Participants
- Nymfalis village 31<sup>st</sup> January 2018
- Presentations by Bear Expert & NGO "Archaeo"
- Guided tour of Nymfalis School by "Archaeo" experts on Bear biology & local life significance and interaction
- Presentations from ESMS-CH staff with details on:
  - Ongoing ecological survey work
  - Critical bear areas indications
  - Social contribution of the project
  - Cultural heritage area importance
- Representatives from local communities' authorities
- Discussion on managing construction works impact and footprint

Econews–February '18

ECONEWS – March 2018  
Wolves Canis lupus



Wolf group	Location
KF 800-8744: Kavala mountain	KF 800-8744: Kavali Forest
KF 397-314: Evrosia mountain	KF 876-8-87500: Kikoni
KF427-8744: Vionio mountain	KF544-87501-2: Ioni - Ierapigi

- ESMS personnel have installed camera traps at several places with wolf presence
- Newborn wolf pups are blind and deaf for about 2 weeks after parturition. They nurse for about 2 months.
- Pregnancy of female wolves lasts for 43 days and occurs in late April to early May (usually from 15/4 to 15/5)
- Wolves sexually mature at the age of 22 months but in some rare occasions when food supply is very abundant even earlier at 11 months of age. Wolves are reproducing only once per year
- Wolf packs in Greece are relatively small and consist of 3 to 11 individuals averaged to about 4 members in early spring

Econews–March '18



## Social & Stakeholder Management

### ➤ Community meetings:

Increased level of engagement with **stakeholders** and **local communities** through **community meetings** prior to construction activities locally



Avoidance of Social community impact

## Social & Stakeholder Management

### ➤ Notifications:

Any disruptions caused to **public services** as well as **noise** and **dust** producing activities require **prior notification** from our side well in advance



Avoidance of Social community impact



## Social & Stakeholder Management

### ➤ Pre – construction surveys:

Social team representatives scan all areas prior to the commencement of construction activities in order to:

- **identify and record sensitive receptors and vulnerable individuals** along the TAP routing.



Crossing with earth road and orchard of cherry trees with anti-hailstone net near KP458.5.

**Avoidance of Social community impact**



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## Social & Stakeholder Management

### ➤ Internal trainings / TBTs:

Our goal  to **increase awareness** on **social issues** within our departments and especially to **foremen, site engineers & labour**.



Avoidance of Social community impact

## Waste Management

- ✓ **Waste Segregation Areas** in all Camps and Pipeyards
- ✓ **Signage** in three Project languages: English, Greek and Italian
- ✓ Smaller **bins for RoW**
- ✓ **Consistent housekeeping**
- ✓ **Hazardous waste** management
- ✓ **Dedicated personnel** responsible for waste segregation
- ✓ **Training** through TBTs & presentations to Foremen
- ✓ **Continuous** ESMS inductions and daily site supervision

- **Reduce**
- **Reuse**
- **Recycle**



Non Hazardous waste Segregation



Hazardous Waste Management



## Hazardous Waste Management – Asbestos Removal Case

- During Pre Construction Surveys **10 waste disposal sites** were identified – of which **6 contained asbestos soil material**

### Achievements:

- Over **450,000 kg** of asbestos were successfully **removed**
- **No construction delays**
- Upgrading of over **4,000 m<sup>2</sup>** of land in better condition than before!
- **Asbestos awareness raised** for **local communities** on the risks of asbestos for public health and the environment





## Trees - Row clearing - Tree cutting

- **Trees need to be cleared** within forthcoming working area

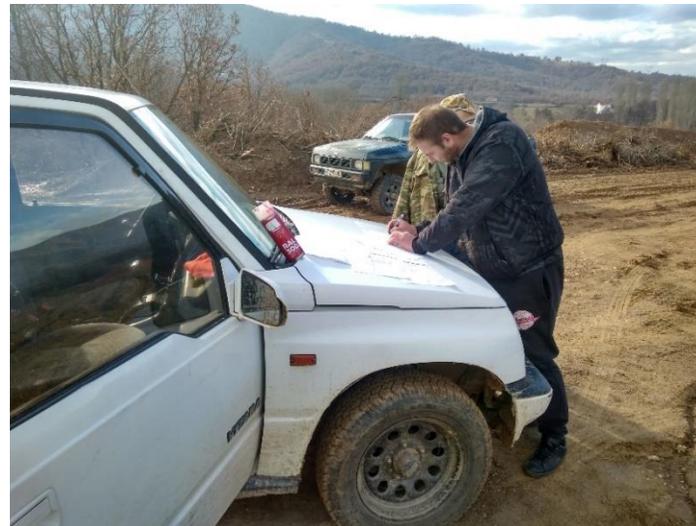


ESMS department ensures that:

- **Permits** are in place
- **Ecological restrictions** are adhered to,
- **Tree Cutting Protocols** are in place

Process followed:

- **Trees** to be cut are **marked**.
- **Trees** that **can be saved** are **marked**.
- **Subcontractor** is instructed to proceed with tree clearance works.
- **Timber is distributed by social criteria** under the supervision of the local **forestry authorities**.
- **34,500m<sup>3</sup>** cut & distributed (total private cultivations)
- Over **400,000 trees** have been planted on cleared RoW and re-forestation areas.



## Ecological Assessments & Monitoring

TAP project traverses via areas of **high biodiversity value**:

➤ Protected Species:

- ✓ **Large carnivores**
- ✓ **Fishes**
- ✓ **Birds**

➤ **ESIA & Studies verified**



➤ **Evaluation of findings:**

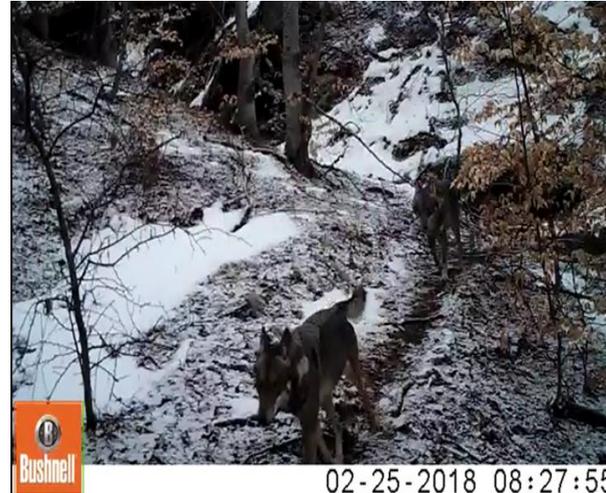
- ✓ **Ecological Surveys**
- ✓ **Daily Monitoring**



➤ Area Characterization (**High Risk Areas**)



➤ Specific Mitigation Plans (**Bear, wolf, Jackal, deer, Aquatic species etc.**)



## Ecological Assessments & Monitoring

➤ Tools and Planning timeline:

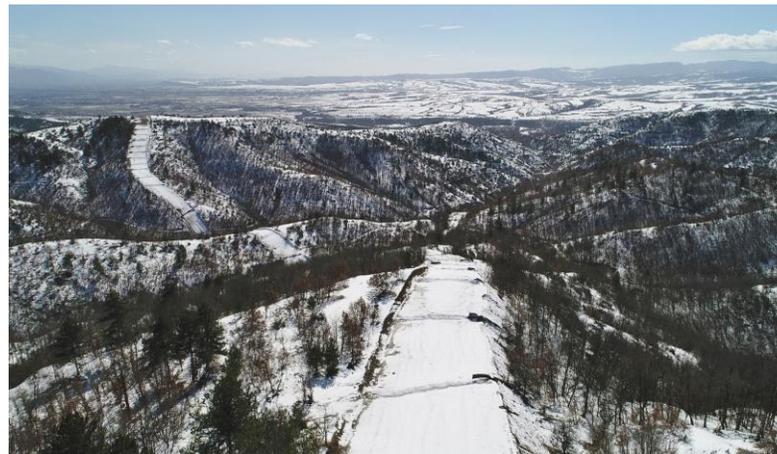
- ✓ *PCS data – Camera Traps*
- ✓ *Periodical Site Walkthroughs*
- ✓ *Eco Surveys Calendar*
- ✓ *Drone Recordings*
- ✓ *Eco Experts Assessments*
- ✓ *ArcGIS Georeferenced Database*
- ✓ *Re-Entry Assessment Plan*



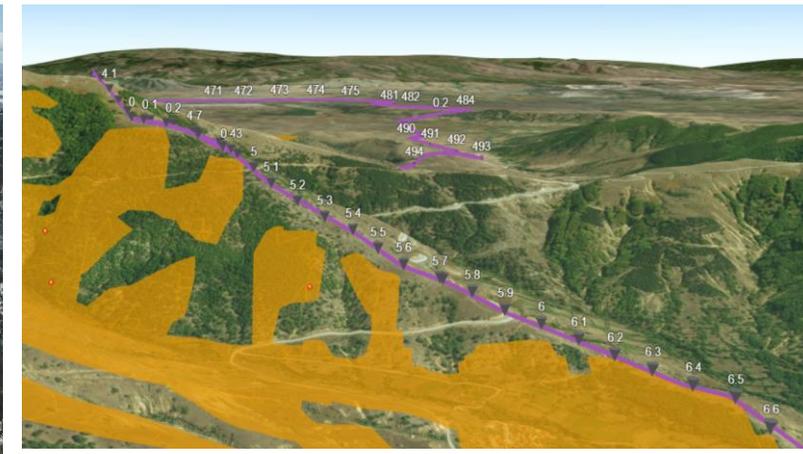
Periodical Walkthrough



Installation of camera traps in ROW



Drone Recordings KP547 – Faltsata



Drone Recordings 3D Data Rendering with visual assessment (Klisoura, KP498 – 502)





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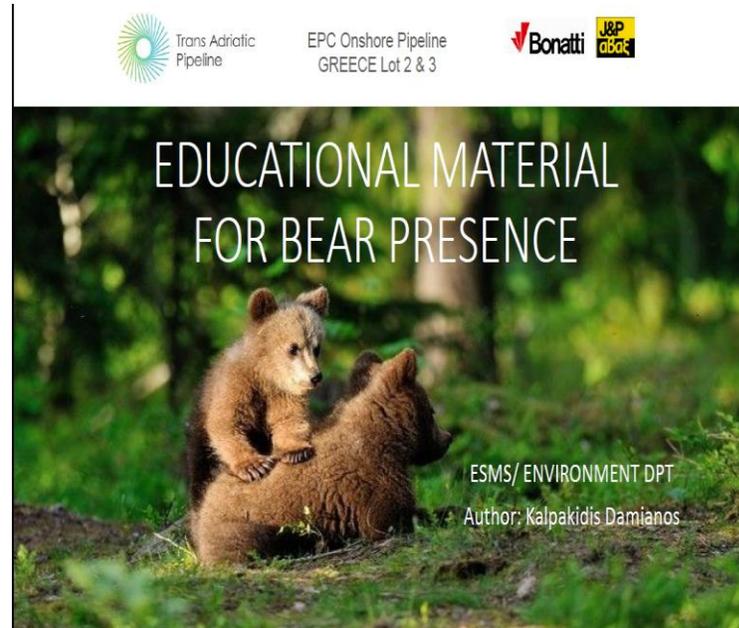
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# Ecological Assessments & Monitoring

## Bear Mitigation Plan & Preventive Measures



Installation of Bear Signs



Bear Educational Material



Label and Poster installed at Bear Habitat Areas



## Ecological Assessment & Monitoring

### Aquatic fauna protection activities

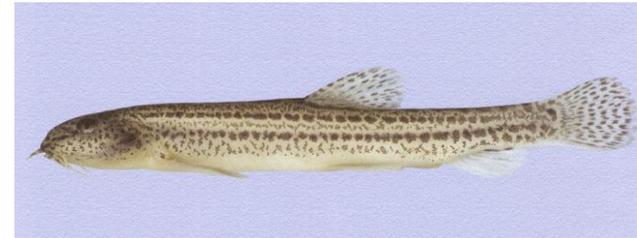


Philippi 9 watercourse crossing during the electrofishing activities

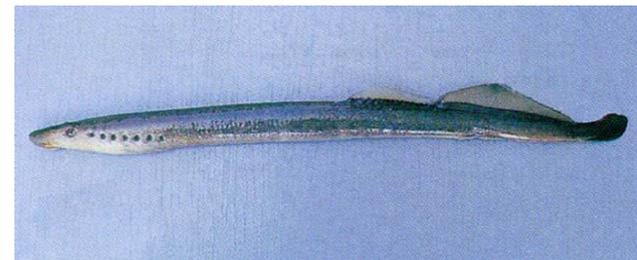


Philippi 9 Return of aquatic fauna

Salvage of protected aquatic fauna of two endemic species classified as Vulnerable (VU) according IUCN criteria in collaboration with Specialists.



Aggitis Spined Loach



Greek Brook Lambrey



## Reinstatement

### Reinstatement Procedure flow

- ✓ Collection of data:
  - **ESIA**
  - **PCS:**
    - ✓ **Walkthroughs**
    - ✓ **Video (Drone – GoPro)**
    - ✓ **Photos**
  - **Bio-Restoration/Forestry Studies**
- ✓ Land Characterisation:
  - **Standard Areas**
  - **Special Areas**



Reinstatement completed (Agricultural Land)



Reinstatement completed (Special Area)

## Reinstatement

### Successful Implementation

- ✓ ESMS Training
- ✓ Topsoil protection - RoW Clearing
- ✓ Site Monitoring
- ✓ Departments Coordination
  - ESMS
  - Construction
  - Quality
  - Engineering

October 2017



April 2018





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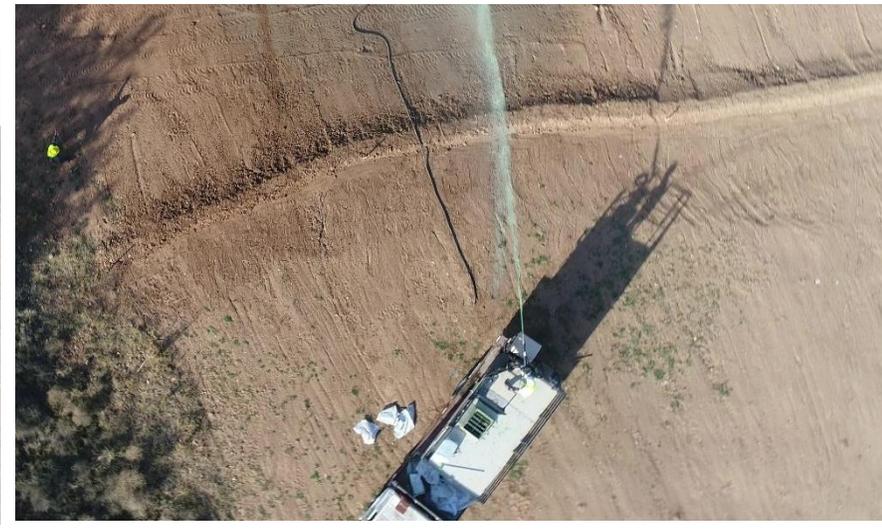
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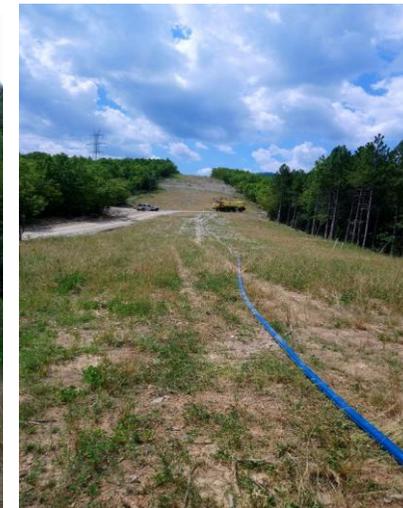
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## Bio-Restoration Activities

### Hydroseeding



### Tree Replantation



## Cultural Heritage Management

- ESIA identified sites
- More areas of archaeological or historical value were **expected to be revealed** during the construction life of the TAP project

### The challenge

The unforeseen nature of the cultural heritage scope was to be managed and communicated to all construction teams in a timely manner, so as to achieved **one common target**:

- ✓ **No impact to Cultural Heritage sites**
- ✓ **Facilitation of progress of the construction activities**



## Cultural Heritage Management

➤ **More than 1000** archaeologists, designers, conservators, experienced workers, engineers and CH experts have been involved

➤ At the peak of the project (May 2017) CH Personnel simultaneously working = **633**,

➤ Archaeologists: 102

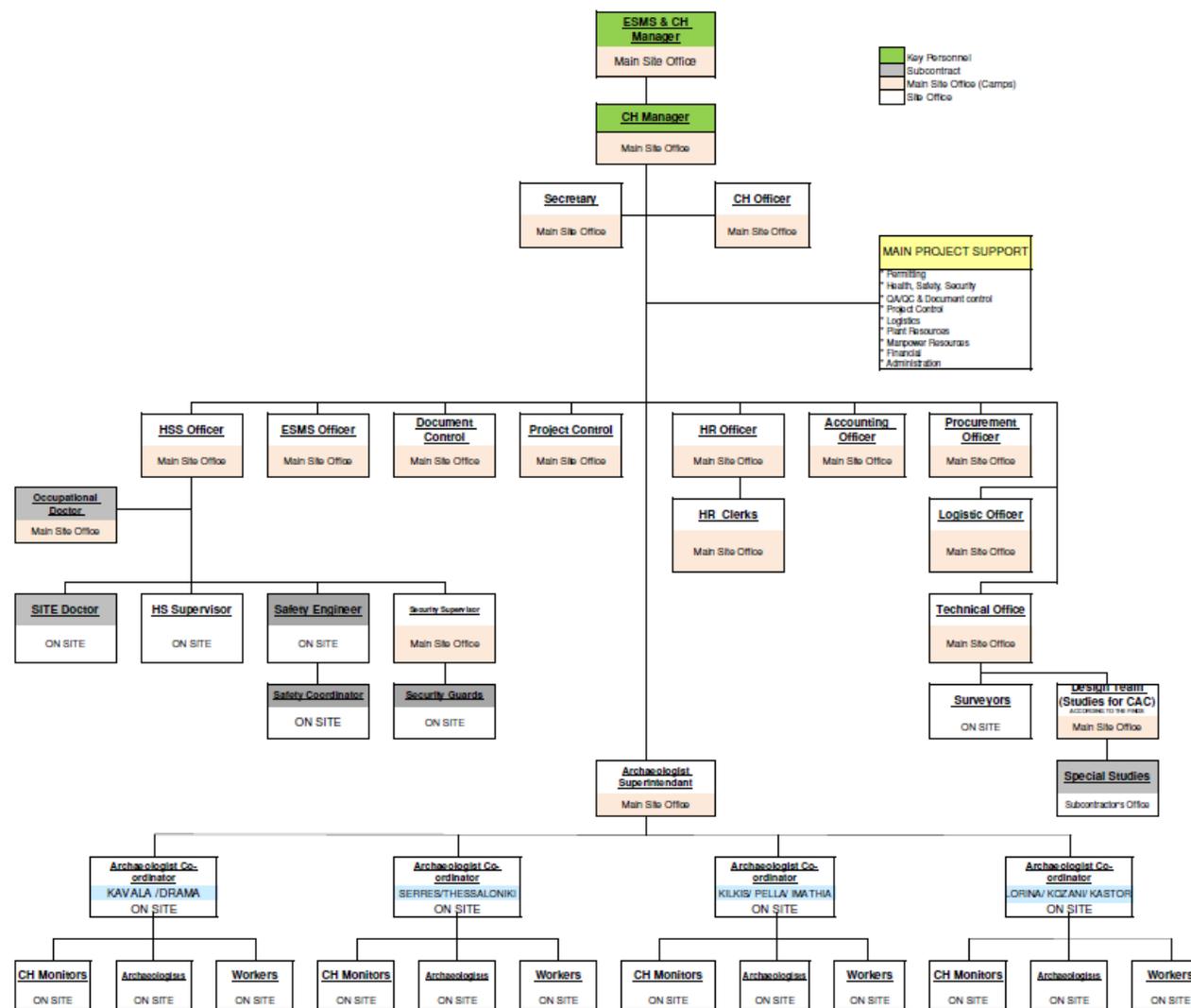
➤ Designers: 20

➤ Conservationists: 32

➤ Labour: 480

➤ **1.223.857** total direct man-hours

\* Data up to 06/2019



## Cultural Heritage Management

High priority → **education and training** of all the involved personnel.

The Cultural Heritage training → aims to **increase all personnel's cultural heritage awareness** via:

- An **ESMS-CH induction** training course
- **Daily Tool box talks** of CH Good Practice
- **CH Posters** at all the **Camps & Pipeyards** of the Project
- CH **informative leaflets**
- Periodic **ESMS-CH Stand Downs**.

The results:

- Along **364,250 m** of RoW cleared & pipeline trench opened **no damage/incident to cultural heritage artifacts**.
- **471** archaeological or historical sites extending in **more than 30 km of pipeline route** have been identified, investigated, rescue excavated, avoided or backfilled for protection



Cultural Heritage Awareness Material

## Cultural Heritage Management

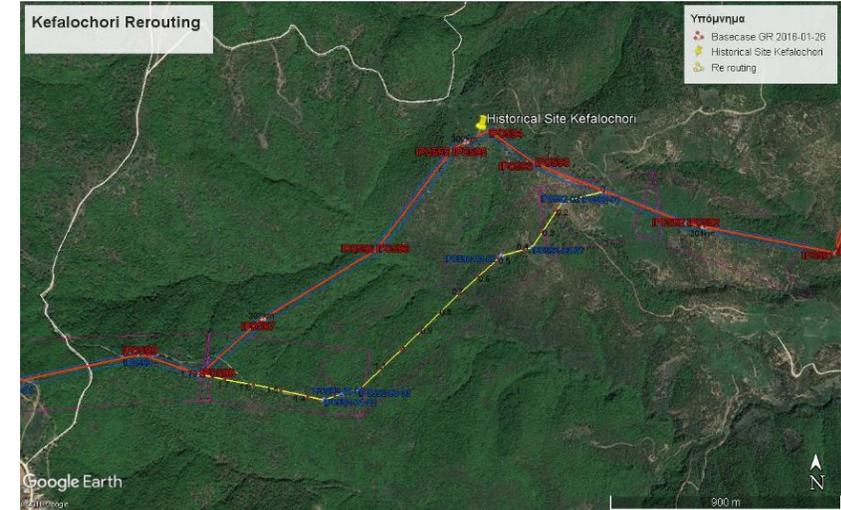
The main principle:

- **Avoidance**
- **protection** of the cultural heritage

where that is not possible = **archaeological rescue excavations.**

Measures for impact avoidance:

- **Pre-construction surveys** (ESMS & Construction teams)
- **Pre-construction archaeological trial trenching**
- **Full-time CH Monitoring** of construction activities
- **Fencing, signage and exclusion of CH areas** from construction activities
- **Backfilling and protection** of CH areas
- **Archaeological trial trenching**
- **Rescue excavation**
- **Rerouting**





## Cultural Heritage Management – Achievements & Findings

In the context of the Cultural Heritage Project, some examples of archaeological significance:

- **settlements from prehistoric to Byzantine period,**
- **remains of ancient workshops and farmhouses** mainly from **Roman time,**
- **cemeteries and isolated graves** from **Hellenistic and Roman periods.**



Simvoli, Serres, Roman and Late Roman Cemetery



Karteres, Thessaloniki, Roman Workshop for leather processing



## Cultural Heritage Management – Achievements & Findings

The **Necropolis at Isoma, Kilkis** has been one of the most important burial findings. It dates back to the Hellenistic and Roman periods and includes burial gifts such as golden jewelry and hoards of coins among others.



Isoma, Kilkis, Hellenistic and Roman Cemetery





## Cultural Heritage Management – Achievements & Findings

Important ancient remains for the Greek history and archaeology were avoided and protected:

- **1 major and 2 minor/slight re-routings of the pipeline axis were agreed**
- The ruins of a **Late Byzantine Church** in **Kastoria**
- A **public structure** in **Pella** - capital city of ancient Macedonia
- And an area with a **prehistoric cemetery** and settlement from Roman times in **Serres**.





## Cultural Heritage Management – Achievements & Findings

- All archaeological findings from TAP Construction belong to the Hellenic Ministry of Culture and Sports & the Greek State.
- All exhibits are kept within Museums of respective Ephorates of Antiquities per Municipality.
- It is expected that the most fascinating items will be displayed at existing or new areas of Museums all along northern Greece, where visitors may marvel upon the hidden treasures brought to light by this exceptional construction project!



Archaeological findings (adorned Neolithic potsherds)  
from Messorachi, Serres, April 2018



Vase Discovered in Pella, September 2017

Thank you very much for your attention

