

ENVIRONMENTAL, SOCIAL AND CULTURAL HERITAGE OVERVIEW











Introduction

The Trans Adriatic Pipeline (TAP) is one of Europe's most important energy infrastructure projects. The Environmental, Social and Cultural Heritage Overview is part of TAP's ongoing commitment to provide stakeholders with clear, relevant and comprehensible information that enables a proper understanding of the project.

This commitment stems from TAP's Values and Code of Conduct and complies with the national requirements of the project's three host countries (Greece, Albania and Italy), the relevant European Union Directives, and the following international standards for managing project environmental and social risk, referred to throughout this document as 'lender standards':

- European Bank for Reconstruction and Development (EBRD) Performance Requirements (2014).
- International Finance Corporation (IFC) Performance Standards (2012).
- European Investment Bank (EIB) Environmental and Social Practices and Standards (2013).
- The Equator Principles III (2013).
- Common Approaches of the Organisation for Economic Co-operation and Development (OECD) on environmental and social due diligence (2012).

TAP is committed to effectively managing the Environmental, Social and Cultural Heritage (ESCH) risks and opportunities associated with the project as well as delivering benefits to local community members and the company's shareholders. The approach to managing these risks is designed to reflect the scale and nature of project activities and will be adapted as these change.

During the planning and construction phase of the project, TAP's ESCH performance management is focused on implementation of a set of prioritised steps, known as a 'mitigation hierarchy'. This is a systematic and dynamic process of assessment, activity planning, management, mitigation and monitoring.







Through its compensation and livelihoods support programmes, employment and training of local people, flow-on benefits to local and regional economies, and social and environmental investment programme, TAP aims to ensure that communities benefit and are not adversely impacted by the project.

TAP's approach to ensuring the conservation of biodiversity and natural habitat is based on embedding measures that avoid impacts to biodiversity from the outset. If that is not possible, TAP will implement measures to minimise and mitigate any impacts. As a last resort, offset programmes will be developed to ensure there is no net loss of biodiversity and, in critical habitat, that a net gain is achieved. Intended for the non-technical reader, with technical terms explained in the text and glossary, this document summarises the processes that have been applied to the planning, design, construction and operation of the pipeline in TAP's host countries. Among the key processes outlined are:

- Stakeholder engagement.
- Grievance management.
- Environmental and social impact assessments (ESIAs), additional studies and subsequent document updates.
- Biodiversity and cultural heritage assessments and TAP's mitigation, management and restoration plans.
- Land easement and acquisition (LEA).
- Environmental and social impact management during construction and operation.

Every effort has been made to ensure that the information contained in this summary is correct at the time of publication. Readers seeking further detail are referred to the TAP website at *https://www.tap-ag.com*, where the latest up-to-date public information is available.

Any questions or comments regarding this summary of the project are welcome and should be directed to the relevant TAP offices listed on page 71 and at https://www.tap-ag.com/contact-us

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01 Introducing the Trans Adriatic Pipeline

What is TAP?

TAP will enable Caspian natural gas to be transported to Europe through Greece, Albania and Italy by 2020.



Connecting with the Trans Anatolian Pipeline (TANAP) at the Greece-Turkey border, TAP will cross Northern Greece, Albania and the Adriatic Sea before coming ashore in Southern Italy to connect to the Italian natural gas network.

The pipeline will contribute to Europe's energy security and diversity, supporting the European Union's strategic goal of securing future gas supplies and meeting its changing energy needs. Natural gas reduces reliance on coal and is an important element of Europe's strategy in the short-term for reduction of greenhouse gas emissions.

TAP's shareholders - SOCAR, Snam, BP, Fluxys, Enagás and Axpo - are major energy companies with significant expertise in delivering complex international projects safely, on budget, on time and to specification.

TAP and its shareholders take environmental, social and cultural heritage management, corporate social responsibility, and health and safety very seriously. The company complies with all legal requirements, implementing good international industry practice and the applicable lender standards.

The pipeline

The TAP pipeline will span 773 kilometres buried onshore (550km in Greece, 215km in Albania, 8km in Italy) and 105km offshore. Its design has been developed in accordance with recognised national and international safety standards.

The pipeline will be formed of continuously welded, high-grade carbon steel. Between its entry point in Greece and the compressor station near Fier in Albania, it will have an outside diameter of 120cm (48in). Remaining sections will have a 90cm (36in) diameter.

TAP's initial capacity of 10 billion cubic metres of gas per year (bcma) is equivalent to the energy consumption of approximately seven million households in Europe.

Anticipating future needs, the pipeline design has the flexibility to accommodate higher gas volumes. Throughput could be doubled to 20bcma, as additional energy supplies come on stream, by converting existing TAP facilities into compressor stations.

The pipeline will also have a so-called 'physical reverse-flow' feature, allowing gas from Italy to be diverted to South East Europe if energy supplies are disrupted or more pipeline capacity is required to bring additional gas into the region.

TAP's key features





Can expand from 10 to 20bcm/a

878 km of which 105 km offshore



Built-in physical reverse flow



48" (pipe diameter) onshore 36" (pipe diameter) offshore



The facilities

In addition to the pipeline, TAP will include the following facilities:

- Two compressor stations: one near Kipoi, Greece and one at the start of the offshore section near Fier on the Albanian coast. The compressor stations provide the energy to move gas through the pipeline.
- A metering and pigging station at the border between Greece and Albania on the Albanian side near Bilisht which would be converted to a compressor station as part of the 20bcma phase. Metering allows monitoring of the system; pigging enables operators to perform maintenance, cleaning and inspection without stopping the flow of gas in the pipeline.
- A pigging and block valve station near Serres in Greece which would be converted to a compressor station in the 20bcma phase.
- A pipeline receiving terminal (PRT) near Lecce in Italy.
- Thirty onshore block valve stations (BVS) in Greece and Albania and two onshore BVS on either side of the Adriatic Sea. Block valves are situated along the pipeline to enable TAP to isolate individual sections of pipeline for maintenance purposes.
- Fibre optic cable running parallel to the entire pipeline system. This will enable a two-way communication feed from the pipeline and associated assets, such as the compressor and block valve stations, to the supervisory control centre at the PRT.

The TAP pipeline is designed for a technical life of 50 years. Based on international pipeline industry experience, the actual lifetime could be significantly longer.

Southern Gas Corridor

Once built, TAP will provide a direct gas transport route from the Caspian Sea to Europe. The pipeline will form part of the Southern Gas Corridor (SGC), a 3,500km-long gas value chain which includes several planned natural gas infrastructure projects and in total represents an investment of approximately US\$40 billion.

Aimed at improving the security and diversity of the EU's energy supply, these projects will bring new supplies of natural gas via new routes from the Caspian region to Europe. They include:

- The Shah Deniz 2 natural gas field, an offshore subsea development in the Azerbaijan section of the Caspian Sea.
- Expansion of the natural gas processing plant at the Sangachal Terminal on the Caspian Sea coast in Azerbaijan.
- Three pipeline projects: the South Caucasus Pipeline (SCPX) in Azerbaijan and Georgia, the Trans Anatolian Pipeline in Turkey, and TAP in Greece, Albania and Italy.
- Expansion of the Italian gas transmission network.
- Possibilities for further connection to gas networks in South Eastern, Central and Western Europe.

The SGC is a major component of EU energy policy. TAP's role in realising that vision will provide important economic benefits and ensure that one of the continent's vital energy routes remains viable for decades to come.

Construction schedule



The anticipated programme for the design, construction and commissioning of TAP.

TAP is designed to be operational in 2020 for the delivery to European markets of natural gas from the Shah Deniz 2 (SD2) field in the Caspian Sea. The project schedule is in full alignment with upstream developments. This means that exact timings will depend on the progress of the SD2 development and construction of the Trans Anatolian Pipeline (TANAP).

Discover more about TAP and the current status of construction:

https://www.tap-ag.com/about-us and https://www.tap-ag.com/the-pipeline/project-timeline





What is TAP's commitment to the environment, communities and people affected by the project?

Health and Safety

TAP's health and safety targets are zero casualties and no serious incidents. The project recognises its over-riding duty to avoid or mitigate any adverse health and safety impacts and issues associated with project activities on its host communities and workforce.

TAP is committed to identifying, avoiding, minimising or mitigating the risks and adverse impacts to the health and safety of communities affected by the project. It is also committed to providing safe and healthy conditions for its workers and informing, training, and consulting them on health and safety.

TAP's safety measures are designed in accordance with the following hierarchy:

- *Eliminate:* wherever possible, hazards are designed out to make the site inherently safe.
- **Prevent:** where it is not possible to eliminate a hazardous material or process, measures are taken to ensure that hazards are minimised.
- **Detect:** if a hazardous event occurs, the design ensures that it will be detected rapidly.
- **Control:** measures will be in place to control a hazardous event.
- *Mitigate:* suitable measures will be incorporated into the design to mitigate the effect of a hazardous event where such measures are effective and appropriate.



Comprehensive risk-based competency training programmes are also conducted and the health and safety performance of the project's contractors and suppliers monitored closely at all times to ensure that TAP meets its obligations.

TAP has created a culture of 'lessons learned' through health and safety networks where day-today experiences are shared and integrated into operations.

Emergency response

TAP ensures that systems, resources and trained personnel are in place for an effective response to any emergency. Throughout the pipeline's lifespan, TAP will cooperate with national and local emergency services and other relevant agencies to ensure that the appropriate level of preparedness is identified and maintained.

Environment

TAP's commitment to the environment is at the very heart of this pioneering project. TAP is committed to complying with host country and EU legislation and to implementing the environmental, social and cultural heritage (ESCH) performance requirements of the prospective project lenders.

The pipeline's route has been selected carefully to avoid, wherever possible, areas with ESCH sensitivities. Facilities will be carefully located and operated to reduce any potential physical and ecological impacts. CHAPTER 02. Commitment What is TAP's commitment to the environment, communities, and people?



Assessing environmental and social impacts – ESIAs

Before a trench could be dug or a single metre of pipeline laid, extensive preparatory and consultative work had to be undertaken by TAP.

In addition to technical and commercial feasibility studies and preliminary engineering and design work, a project of this scale and size needs to understand the potential impacts it will have on the people and places along its route.

To do this, TAP commissioned local and international experts to conduct several detailed surveys in its host countries of Greece, Albania and Italy. Known as Environmental and Social Impact Assessments (ESIAs), these important studies analysed the risks and opportunities associated with the pipeline project.

Each country ESIA was conducted in accordance with the applicable national laws, regulations and standards.

The ESIAs carefully considered the environmental, social and cultural heritage (ESCH) impacts of TAP.

The project follows a mitigation hierarchy of measures to avoid creating such impacts and, where this is not possible, to implement additional measures that would minimise, mitigate and, as a last resort, offset and/or compensate any potential residual adverse impacts.

To attain the above, the ESIA process has identified the project's ESCH risks and opportunities in a systematic and comprehensive manner. This has further informed the development of ESCH management plans that guide the activities of TAP and its contractors during the construction, operation and closure phases of the project.

During operations, there will be minimal impact, mostly limited to the pipeline's aboveground installations.

The ESIAs also include a detailed description of the proposed pipeline route in each country, permanent and temporary infrastructure created during the construction phase, such as access roads and construction camps, and operational facilities that will be in place when construction is completed. The level of detail carried out by TAP on its ESIAs goes beyond national requirements in all its host countries, including open and transparent dialogue with stakeholders along the pipeline route.

ESIAs were submitted to the appropriate national, regional and local authorities in each country as part of the regulatory approval procedure for construction and operation of the pipeline.

Full ESIAs have been approved in each host country – Albania (January 2013), Greece and Italy (September 2014). There have been several subsequent amendments to the Greece and Albania ESIAs to reflect stakeholder concerns as well as further refinement of TAP's route and facilities.

See Chapter 6 and visit TAP's website at www.tap-ag.com for further information on the ESIA process in each host country.

Corporate Social Responsibility

In 2016, TAP launched a new Corporate Social Responsibility (CSR) policy, detailed below.

At the Trans Adriatic Pipeline, we understand that the long-term success of the company is based on building and maintaining our social licence to operate. We will achieve this by developing enduring relationships with our stakeholders at international, national, regional and local levels and working with them to sustain broad community support.

This approach is based on our commitment to deliver shared value for our stakeholders and operate in a way that enhances the benefits generated by company activities. In this way, we will actively manage the social risks and opportunities generated by the construction and operation of the Trans Adriatic Pipeline. Our approach to CSR is tailored to meet the Company's activities and will be modified as those activities change. This policy applies to all our activities and areas of operation. It is also applicable to our Contractors.

We are committed to:

- Working to high standards of Health and Safety;
- Acting in accordance with TAP's Code of Conduct "Living Our Values";
- Proactively engaging with our stakeholders and respecting local culture;
- Understanding and managing our social and environmental impacts;
- Working in partnership to support local communities to meet their development priorities;
- Respecting the cultural heritage of the countries in which we operate;
- Facilitating opportunities for the local people and businesses to benefit directly and indirectly from company activities;
- Complying with, and striving to exceed, applicable international standards; and
- Respecting human rights, within our area of influence.

We have in place management systems to ensure our commitments are met, including applicable strategies, plans, measuring and review procedures.

These management systems have been designed to harmonise our approach to CSR in areas affected by our activities, whilst respecting the local context of the countries in which we work.

Community Human Rights

TAP adheres to the Voluntary Principles on Security and Human Rights (VPSHR). These are designed to guide companies in maintaining the safety and security of their operations within an operating framework that encourages respect for human rights. The project collaborates with International Alert, a non-profit organisation, for its VPSHR implementation.

This proactive approach ensures that human rights considerations remain at the forefront of the project's activities. Key to TAP's commitment is understanding how its activities might impact human rights, identifying any abuse, and actively managing risks and opportunities to improve the conditions of people affected by the project.

TAP complies with all domestic laws concerning employment, international labour laws and conventions, health, safety, and security. The project is committed to upholding the principles set out in the United Nations Universal Declaration of Human Rights.

TAP also requires its contractors to uphold the International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work.

Learn more about TAP's collaboration with International Alert here:

https://www.tap-ag.com/our-commitment/to-thelocal-community/commitment-to-vpshr

Engagement

Engaging with stakeholders requires a continuous dialogue with people who are or might be affected by TAP. Inclusive and culturally appropriate consultations conducted in Greece, Albania and Italy provide stakeholders with opportunities to express their views and learn more about the project.

Prior disclosure by TAP of relevant and adequate information enables stakeholders to understand the risks, impacts and opportunities of the project. TAP identifies individuals, households, communities and other entities that may be affected by the project as well as other stakeholders, such as regulatory bodies, local governments, and NGOs.

Relevant project information, in particular that related to environmental, social and cultural heritage impacts, health and safety hazards and emergency management, is disclosed at local level in a manner that is accessible, understandable and culturally appropriate for those affected.

Social & Environmental Investment (SEI)

TAP will invest more than €55 million in Greece, Albania and Italy



Social and Environmental Investment

The goal of the TAP SEI programme is to contribute in a sustainable and inclusive way to improved livelihoods and quality of life within local communities in proximity to the pipeline. Based on extensive dialogue with these communities, TAP will focus the SEI programme on:

- Strengthening livelihoods.
- Supporting improved community quality of life.
- Enabling improved skills and abilities through support for education and training initiatives.
- Enhancing environmental management including support for biodiversity.

These TAP-wide themes are then targeted at the most locally-appropriate focus area in the project's neighbouring communities.

Discover more about TAP's commitments:

https://www.tap-ag.com/our-commitment and https://www.tap-ag.com/resource-library/referencedocuments/project-finance-disclosure

Values

TAP's values guide the project's activities and give its people direction when making decisions. An integral part of the TAP organisation, these values form the firm foundation for how the project does business and interacts with its stakeholders.

Excellence Working together to be the best

People Respectful and open minded

Integrity Do what you say and say what you do

Responsibility Act safely and care for the future





What systems does TAP have in place to manage the project and its impacts?

An environmental, social and cultural heritage management system (ESCH MS) has been developed by TAP to support the project's compliance with the applicable ESCH standards. The system also aims to ensure that the outcomes of TAP's stakeholder engagement activities are implemented. The ESCH MS is a dynamic system designed to adapt to the changing construction and operational priorities of the project. Its key priorities are currently:

- The systematic identification, avoidance, mitigation and management of ESCH risk during construction.
- Design and procurement of TAP's operational facilities.
- Restoration of any impacts to livelihoods and reinstatement of the Right of Way.
- Management of the project's engineering, procurement and construction (EPC) contractors.
- Preparations for the operational phase and commercial operation of the pipeline.
- Occupational health and safety management of the construction workforce and the safety of the adjacent community (a summary of the TAP H&S management system is provided at the end of this chapter).



To ensure that TAP's ESCH organisation has the appropriate capabilities aligned with the relevant standards, the ESCH MS includes:

- Supplementary ESCH assessments and supporting studies.
- ESCH management system plans and procedures.
- An organisation that integrates the ESCH standards into project planning, implementation, performance reviews and reporting.

The ESCH MS documents, listed below, have been disclosed as part of a package of supplementary information about the TAP project that is made available to the public. This documentation can be viewed through the weblink at the end of this chapter.

Supplementary ESCH assessment and supporting studies

Environmental and Social Impact Assessments (ESIAs) for each of TAP's host countries were produced in 2013. The ESIAs were aligned with the applicable country standards and approved by the competent authorities.

After the ESIAs had been prepared and approved, TAP collated additional information on the environmental, social and cultural heritage sensitivities along the pipeline route. In line with good industry practice, this activity was designed to support construction readiness and execution.

To make best use of the additional data and further inform the ESCH management system, supplementary assessments and studies have also been completed by TAP. While not required by country legislation, they have been prepared and disclosed to provide greater stakeholder insight into the project's approach to the identification and evaluation of environmental and social issues. The supplementary ESCH assessment and supporting studies include:

- Cumulative Impact Assessment
 - Presents in a single document an assessment of thirdparty projects that potentially overlap with TAP's area of influence.
- Associated Facilities Assessment
 - Presents and summarises upstream, downstream and interconnector projects.
- Route Assessment
 - Consolidates the ESIA assessment of the route options in each of the three host countries.
- Critical Habitats Assessment
 Identifies and catalogues sensitive and protected ecological habitats and species along the route to promote biodiversity conservation priorities.
- Supplementary Ecological Assessment
 Uses recent ecological data to confirm that the ESIA mitigations are still appropriate.

ESCH management system

The foundations of the TAP ESCH MS are the applicable standards and expectations included in the following source documents:

- TAP policies such as Corporate Social Responsibility, Corporate Security, Quality, and the Code of Conduct.
- National environmental and social laws and regulations applicable to the project in its host countries.
- EU legislation.
- International conventions.
- Lender requirements.
- Approved TAP ESIAs.

These source documents were integrated into the planning and construction activities of the project's EPC contractors, along with the practical requirements for issues such as ecological, waste or pollution prevention management. To this end, TAP issued its contractors with the following documents:

- Environmental standards with numerical and performance requirements; e.g. for waste water discharges.
- Contractor Control Plans (CCPs) that focus on separate ESCH themes; each CCP specifies ESIA commitments, the applicable standards, and requires the EPC contractor to prepare plans for their implementation.
- Design and construction specifications focusing on erosion, reinstatement, bio-restoration, and noise and vibration assessment/monitoring.

To support TAP's implementation of ESCH standards, control plans and specifications, and to define the tools and processes which TAP uses to manage, monitor, measure and report compliance, the following management plans and processes have been developed:

- Environmental engineering controls.
- Construction phase ESCH management plans.
- ESCH management plan implementation processes:
 - Route environmental and social impact management registers.
 - Management of change process.
 - Non-conformance and incident reporting.
 - Reporting and review.



Environment engineering controls

A verification and assessment process has been developed to ensure that the engineering decisions and design work for TAP's facilities are aligned with the project's mitigation hierarchy (a systematic and dynamic process of assessment, activity planning, management, mitigation and monitoring; see Chapter 7 on Mitigation for more details).

The process documents the engineering evidence for design work and includes assessments – such as noise modelling and control studies, emissions quantification and energy efficiency studies – which aid selection of the best available technology.

A programme of verification inspections and tests will be implemented to confirm the performance of such measures as noise cladding or drainage systems and support the construction, commissioning and introduction of gas into the TAP facilities.

Construction phase ESCH management plans

ESCH management plans address the full spectrum of ESCH issues. They include information on the oversight, compliance and assurance activities of the project's EPC contractors, and TAP's governance processes. The following table provides an overview of TAP's ESCH management documents:

TAP ESCH Management Documents

No.	Category/title	Issues covered
1.	Control / Assurance Environmental & Social Compliance Assurance Plan	 TAP and contractor responsibilities. Contractor Assurance Programme. TAP Assurance Programme (oversight and assurance). Non-conformance, work improvement notices and corrective actions recording.
2.	Environmental Ecological Management Plan	 Overarching biodiversity management control document. Project biodiversity management system. Biodiversity identification, management, monitoring and restoration.
3.	Biodiversity Action Plans (BAPs)	 Species and site-specific monitoring programme. Long-term biodiversity initiatives such as biodiversity offsets.
4.	Bio-restoration Management Plan	 Bio-restoration planning. Bio-restoration execution. Monitoring, maintenance and aftercare.
5.	Soil Erosion and Reinstatement Plan	 Soil erosion controls and associated standards and monitoring. Temporary and permanent erosion control measures. Inspection and maintenance programme. Reinstatement and revegetation measures.

6.	Watercourse Crossing Plan	 Overarching philosophy for works at watercourse crossings including: Watercourse characterisation. Watercourse crossing design. Ecological considerations and constraints. Environmental protection measures. Construction methodologies. Reinstatement and monitoring.
7.	Waste Management Plan	 Waste hierarchy and minimisation. Identification and classification of waste. Waste handling (i.e. collection, segregation and containers, storage, treatment, transport and documentation, disposal) Monitoring and reporting.
	Social Documents	
8.	Social Impact Management Plan	 Overarching framework for social impact management. Describes approach to ensuring mitigation of project-associated social impacts. Tool to guide TAP staff and contractors in social impact management. Supports alignment and integration of TAP social performance functions.
9.	Stakeholder Engagement Strategy and management plans	 Overarching framework for all stakeholder engagement-related activities. Stakeholder identification. Stakeholder engagement programme. Monitoring and reporting.
10.	Grievance Management Framework and management plans	 Framework for all third-party grievance management. Process for managing and resolving grievances. Grievance classifications and definitions. Reporting and monitoring requirements.
11.	Industrial Relations Management Plan	 Training and skill development activities. Employee grievance mechanism. Monitoring and reporting.
12.	Livelihoods Restoration Plans	• Ensure adverse impacts on people, their rights, livelihoods, culture and environment are avoided or, where not possible, minimised, mitigated, offset and/ or compensated.
13.	Social & Environment Investment Strategy	 Approach to social and environmental investments, monitoring and evaluation. Implementation plans in each host country.
	Cultural Heritage	
14.	Cultural Heritage Management Plans	 Chance find management and response. Interface and coordination with relevant authorities. Monitoring and reporting of activities to recover and record cultural heritage assets.
	Health and Safety	
15.	Project Health and Safety Plan	 HSMS structure, tramework and H&S organisation. Minimum health and safety standards that contractor must meet. Procedures for risk management, performance targets and contractor management.
16.	Emergency Response Strategy	 TAP Emergency Response organisation. Duty manager system and external engagement. Responsibilities of teams and functions (including checklists) and facilities required in Emergency Response room.

ESCH management plan implementation processes

Route environmental and social impact management registers

Constructing a natural gas pipeline across three European countries is fundamentally a 'linear' project and different environmental and social risks will be encountered along TAP's 878km route.

The TAP and EPC contractor teams need to be aware of these risks and have effective site-specific measures available to implement the project's mitigation hierarchy.

Dynamic management tools have been developed to meet this need. Route Environmental Impact Registers (REIRs) and Route Social Impact Registers (RSIRs) were prepared for each country before the main construction work started. These living documents are being maintained and upated throughout the construction period and site restoration and reinstatement process. An overview of the REIR and RSIR process is provided below.

Identify	All sensitive sites in proximity to the Right of Way potentially impacted by construction or operational activities.	
Assess	All aspects of identified sites, including an assessment of risk, both to the environment and assets/livelihood, and to the Project.	
Prioritise	Sites for further assessment, monitoring, engagement with external stakeholders and pro-active mitigation as appropriate.	
Plan	Assessments & mitigations as required, including rapid field assessments and site-specific communication & mitigation plans.	
Engage	As appropriate with external stakeholders in order to take a proactive approach to managing impacts.	
Manage	The mitigation of potential impacts during construction and ensure the maintenance and restoration of livelihoods/environmental quality.	
Monitor & Evaluate	Implemented mitigation measures to ensure positive outcomes, monitor effectiveness, and record residual impacts if they occur.	

Preparation of the REIR and RSIR includes a review of the ESIA and post-ESIA survey reports, CCPs, contractor Environmental and Social Implementation Plans (ESIPs), and ESCH management plans that relate to the pipeline section as a whole or its individual features.

At the assessment stage, the potential risk for social and environmental impacts is considered to support classification of the risk level (high, medium and low). This will define the scope and extent of dedicated plans to support engagement, mitigation and monitoring activities.

Discrete site visits are undertaken to medium and high-risk sites to prepare Rapid Field Assessments (RFA) to assess the potential severity and likelihood of impacts and further inform the Register. RFAs are prioritised according to construction schedules and the complexity of impacts to ensure that there is maximum time for assessment and resolution.

Management of change

A change management process has been implemented to ensure that any changes to the project's scope, ESCH standards and specifications or the ESCH management system are assessed and their importance confirmed.

Changes are evaluated to determine their potential impact, the need for and extent of external stakeholder engagement, as well as mitigation and management measures and any requirement to modify the ESCH management system.

A process of notification and engagement with regulators and project lenders has been developed to support the review and approval of proposed changes.

Non-conformance and incident reporting

TAP has developed a process to ensure that all accidental events are reported and classified. Supporting the transparent and consistent implementation of corrective actions, this process enables the sharing of any lessons learned so they can be applied throughout TAP's activities.

A similar approach has been adopted for nonconformances. These are defined as deviations from ESCH specifications/standards or as TAP/EPC contractor management plans that have not been approved by TAP. Non-conformances are typically identified through on-site monitoring, inspections and audits.

Reporting and review

This process supports effective ESCH management, ensuring that it remains 'fit for purpose' and conforms with the appropriate ESCH standards.

TAP and EPC contractor management reviews are undertaken at several levels within the organisation and include the following:

- TAP monthly performance reviews.
- TAP extended leadership team meetings.
- EPC contractor weekly and monthly ESCH and cross-function reviews.
- Weekly project management leadership meetings.
- Quarterly TAP HS and ESCH leadership committees.
- Weekly and monthly ESCH function meetings.

TAP senior management reviews the overall effectiveness of the ESCH management system at least annually. The review examines ESCH performance over the year, identifies opportunities for continual improvement, and summarises significant ESCH risks and their proposed mitigation.

Health and Safety management system

TAP's health and safety management system complies with OHSAS 18001, an internationally recognised standard which incorporates the 'plan-do-check-act' model of systematic management. TAP and its contractors have a fully documented and effectively implemented health and safety system that covers all areas of the work to be performed.

In line with OHSAS 18001, TAP's health and safety plan:

- Specifies minimum standards to be applied to all project and office locations.
- Sets out expectations for contractors that align with TAP values.
- Provides guiding principles for the health and safety management system.

TAP has developed eight Golden Rules for Safety. These address activities that historically have proven to be high-risk, resulting in significant incidents within the industry. TAP believes that all incidents are preventable. The project's goal is zero harm and the Golden Rules provide specific guidance on how this can be achieved.



Discover more about TAP's management systems:

https://www.tap-ag.com/resource-library/reference-documents/project-finance-disclosure

04 Engaging stakeholders

How are people affected by the project consulted?

For TAP, open and transparent stakeholder engagement is an essential component of good business practice and corporate citizenship. It is at the very heart of the project's environmental and social performance.

TAP's Stakeholder Engagement Strategy (SES) defines the scope and direction of engagement activities during the construction and commissioning phase. Its specific objectives are to:

- Describe planned stakeholder engagement (SE) during the project's construction phase.
- Ensure regular, accessible and transparent consultation with stakeholders.
- Provide the framework for:
 - Development of constructive long-term relationships based on two-way dialogue and communication.

- Ongoing stakeholder identification, analysis, mapping and prioritisation; consultation and engagement; risk and issue identification; information sharing; and document engagement and required follow-up actions.

TAP stakeholder engagement is undertaken by an integrated team from across the project, including stakeholder management; Land Management (LM); Environmental, Social and Cultural Heritage (ESCH) management, Social and Environmental Investment (SEI), Government Affairs (GA), and dedicated Engineering, Procurement and Construction (EPC) contractor personnel.

TAP retains responsibility for the development of processes and procedures that guide stakeholder engagement and grievance management during the construction process.





Stakeholder identification

TAP stakeholders are categorised in the following groups:

- Directly affected population: including all owners and users of land and other resources affected by project land access.
- Project affected communities: residents in the project area of influence.
- Vulnerable groups: stakeholders directly or indirectly affected by project land access who, by gender identity, sexual orientation, religion, ethnicity, indigenous status, age, disability, economic disadvantage or social status, may be more adversely affected by project impacts than others and who may be limited in their ability to claim or take advantage of project benefits.
- **National government:** government ministries, state agencies, parliamentary committees, regulators in TAP's host countries.
- Regional and municipal government: all decentralised host-country government.
- Public authorities: education, health, hospitals, civil protection, ports.
- Local businesses and operators, agricultural institutions/associations.
- NGOs, civil society: national and international NGOs and associations.
- Media: TAP has attracted considerable national, regional and local media attention and regularly communicates with journalists.

Keeping track

TAP has developed a comprehensive Stakeholder and Grievance Management Tool (SGMT) to support its SE activities. The SGMT:

- Details the various stakeholders and stakeholder groups.
- Records any consultations or meetings held and information provided.
- Tracks specific grievances lodged and the status of their resolution.

Listening and acting

TAP not only listens to the concerns of its stakeholders. It takes them seriously and, wherever practicable, acts on them.

Numerous modifications to the pipeline's route have resulted from extensive consultation with the project's stakeholders, ranging from national governments to local communities (see Chapter 9 for further details).

In Greece, for example, stakeholders raised concerns of significant socio-economic impacts on local farmers and operational risks to the pipeline itself if the original base case route across the Philippi Plain was chosen.

TAP carefully evaluated three alternative routes and eventually chose a technically feasible and environmentally advantageous alternative for this sensitive area.

In Italy, TAP took great care to design the PRT to integrate with the surrounding landscape and minimise its visual impact. Following consultations with local stakeholders, the size of the terminal was reduced by 40%.

Stakeholder engagement to date

TAP has been engaging stakeholders since 2008 through structured, ongoing dialogue, both pro-actively and as required by law and project standards. A variety of channels have been used to communicate with stakeholders, including:

- Project offices (information spots, Community Liaison Offices).
- Information points and public display processes.
- One-to-one and small group meetings, in particular with government officials.
- Community/public meetings.
- Brochures and posters.
- TAP website.
- Social media.
- Electronic media (radio & TV).
- Print media (newspapers, publications, etc).

ESIA-related engagement

To ensure a consistent, comprehensive, coordinated and culturally appropriate approach to consultation and project disclosure, stakeholder engagement during the ESIA process followed similar steps in each country:

1.Pre-scoping

- 2.Route refinement
- 3.Scoping

4.Main ESIA phase

5.ESIA finalisation and disclosure.

Overall, across the three countries, TAP conducted more than 160 meetings with national, regional and local stakeholders between October 2012 and July 2013.

The majority of meetings were with local political and technical institutions. Sessions were also conducted with economic operators, business representatives and local NGOs. Engagement with local communities included meetings in local markets, letters to citizens, socio-economic surveys, perception surveys and focus groups.

Since then, as the project moves through its preconstruction, mobilisation and construction phases, TAP has been engaging on an almost daily basis with a wide range of stakeholders in each host country.

Land Easement and Acquisitionrelated engagement Greece

Overall, TAP made contact with an estimated 50,000 people with an interest in the project. At an early stage, Cadastral Survey Offices (CSOs) were established in 25 locations along the pipeline route, including one each in Athens and Thessaloniki; a casdastre is a register of property showing the extent, value, and ownership of land.

The project hired local staff for the CSOs and information spots where numerous public displays were held between 2013 and 2015. The staff were trained in appropriate engagement methods and briefed on the project and its land access activities.

More than 2,500 posters were placed in municipal offices and local communities along the pipeline route, 500 newspaper advertisements and 350 e-newspaper web banners published, and 160 radio spots broadcast.

The project encouraged stakeholders to visit the CSOs to review their files, ask questions or lodge concerns about the pipeline routing, compensation process or the project generally. All 25 CSOs were operated until the end of 2015. Five are still in service and will remain open throughout the construction phase.

In 2015, TAP conducted a comprehensive data collection and asset verification exercise with people affected by the project along the pipeline route. This entailed more than 12,000 visits to over 10,000 affected plots and more than 12,200 meetings with individual landowners and users. TAP established temporary call centres and local field offices to facilitate individual meetings with each project-affected person to collect basic demographic data, solicit perceptions of the project, and review and where necessary update the asset inventory of each affected land parcel.

More detailed socio-economic data was also collected from a random sample of 1,500 project-affected households. This would help establish a baseline for future monitoring and inform the design of possible livelihood restoration support programmes.

TAP prepared a Guide to Land Acquisition and Compensation (GLAC) and gave copies to each project-affected person during the census and asset verification process. Small group meetings were organised with government officials at all levels, followed by open stakeholder meetings with affected persons and interested parties in each of the municipalities.

More than 3,750 people attended these meetings, held between December 2014 and June 2015. TAP and its LEA contractors also made significant efforts to engage with and support vulnerable members of the projectaffected population.

This included more than 3,000 home visits to accommodate elderly or disabled people and approximately 2,000 additional meetings conducted at the request of those affected by the project, in the presence of family members and friends.

Albania

The cadastral information and project routing maps are displayed at six Immovable Property Registration Offices (IPROs) in Devoll, Skrapar, Fier, Korça, Berat and Lushnje. Public display offices have also been established in each village, where cadastre updates and improvements have been conducted. Professional staff assist project-affected people in compiling and verifying property documentation and land registration. Greece: more than 50,000 people contacted



31 property registration offices along pipeline route



Italy: more than 1,000 face-to-face meetings

TAP organised close to 50 public display processes in 2014-15 at 10 public display offices near the access road areas and at the 31 IPROs on the pipeline route at that stage in the process.

The project produced and distributed a variety of brochures, posters and leaflets, including the GLAC, to every project-affected person and other key stakeholders.

Engagement with people impacted by the construction and upgrading of access roads included meetings with community members and local authorities in each of the 21 affected areas.

In 2014, TAP conducted three high-level meetings with 30 representatives from national government ministries (Energy and Industry; Agriculture, Rural Development and Water Resources; Environment) to disclose the compensation values and gather feedback. This was followed by 21 meetings with local authorities and project-affected persons, involving close to 400 participants.

The project made compensation values available in 106 affected villages. A total of 150 stakeholders submitted comments, 70% in favour of the disclosed values. After all opinions and inputs were considered, TAP made some minor adjustments which were then presented to the communities affected.

Italy

TAP has conducted 10 public meetings in Italy: four for the wider public and six targeted at specific stakeholder groups such as NGOs, PRT neighbours and the fishing community. The project has held more than 1,000 face-toface meetings with landowners, institutions, authorities, opinion leaders, political representatives and business people.

In addition, since October 2016 TAP has operated an Info Point in Melendugno, receiving 317 visitors up to September 2017. Visitors access the facility to receive more information on the project, learn about TAP's social and environmental investment projects or explore employment and procurement opportunities.

Social and Environmental Investment-related engagement

TAP's SEI programme undertakes stakeholder engagement, including data collection from communities, local, national and regional government, key development participants and NGOs.

This engagement ensures that the project has a clear and up-to-date understanding of community needs and provides communities with the opportunity to help set the SEI programme's investment priorities. TAP hopes that communities will themselves contribute to the majority of SEI interventions, either financially or in kind. Community participation will also be built into the monitoring and evaluation of SEI projects.

Local content-related engagement

TAP and its Engineering, Procurement and Construction (EPC) contractors continuously undertake local content engagement with sub-contractors, local businesses and other key stakeholders. This aims to maximise opportunities for local businesses and workers in the pipeline's area of influence.

To improve cooperation with industrial unions and other relevant organisations in TAP's host countries, the project has conducted a series of business-to-business networking events in Italy, Albania and Greece to discuss local content. The focus of these events has been to attract and encourage greater local content from business communities along the pipeline route.



Discover more about TAP's commitments:

https://www.tap-ag.com/our-commitment/to-the-local-community and https://www.tap-ag.com/ resource-library/reference-documents/project-finance-disclosure



How can people affected by the project raise questions, comments, or concerns?

TAP has established a formal grievance management process as part of its broader engagement with the project's stakeholders. The process ensures that TAP is aware of any grievances concerning its environmental and social performance or construction management, can investigate those grievances, and is able to respond appropriately.

Wherever possible, TAP works with complainants to achieve outcomes that are mutually satisfactory.

Fostering a culture of transparency and responsibility among TAP employees and construction contractors, the process is designed to sustain and enhance mutual trust between the project and its neighbouring communities along the pipeline corridor.

It is also an important management tool that enables TAP to better understand stakeholder concerns and address them proactively through its construction planning and operations.

Dedicated grievance management teams in each of TAP's operating countries are responsible for helping stakeholders access the grievance resolution process. The teams oversee investigation of grievances, ensure that complainants are kept informed of progress, and seek to reach agreement on compensation or the implementation of agreed remedies.

The principles of grievance management

TAP welcomes the submission of grievances and is committed to resolving them fairly and amicably. Following good industry practice and guided by lender standards, it ensures that the grievance management process is:

- Appropriate to the potential risks and adverse impacts posed by the project.
- Culturally sensitive to the ways in which TAP's host countries and communities wish to address concerns.
- Accessible to all members of the public, projectaffected people, and individual and institutional stakeholders at no cost and without retribution; where necessary, the process also provides access to the external review of grievances.
- Clearly communicated through appropriate channels in TAP's host countries.
- Transparent, fair and with clear accountabilities for grievance resolution.

Submitting grievances to TAP

Stakeholders can submit grievances in the Albanian, English, Greek and Italian languages. TAP's grievance mechanism is open to all stakeholders, including individuals, groups, companies, and common interest groups. All individual grievances are confidential but people may also submit grievances anonymously if they wish.

Stakeholders may submit a grievance by:

- Speaking to a TAP or contractor employee.
- Speaking directly to a TAP or contractor Community Liaison Officers or TAP Social Field Monitors.
- Submitting an online grievance form on the TAP grievance website page.
- Submitting a completed grievance form in grievance boxes located at TAP's regional offices, contractors' construction camps or work areas.
- Calling TAP's grievance hotline.
- Sending an e-mail, letter or fax to the appropriate TAP office.

The grievance hotline is operated from 09:00 to 18:00 Monday to Friday by in-country Grievance Coordinators. The focal point of grievance resolution, they are responsible for the process, from receipt and investigation to remediation and closure.

Grievance hotline numbers for each country can be found on page 71.

Every grievance is registered, acknowledged in writing within seven working days, investigated and responded to within 30 calendar days, depending on the severity and complexity of each case.

When TAP receives a grievance, the nature and likely severity of the complaint is assessed and the relevant work-stream asked to investigate.

An acknowledgement is sent to the complainant and the grievance resolution process explained to them.

Following investigation, TAP proposes appropriate actions to resolve the grievance. If the complainant agrees to the proposed actions and implementation schedule, TAP takes the agreed actions or pays compensation where such action is not feasible.

If the complainant disagrees with TAP's proposed action, their grievance may be referred to external review. An External Review Panel will assess the investigation of the initial grievance and determine whether the proposed actions were sufficient, given the evidence provided. The panel may propose alternative actions where it finds that TAP has failed to redress the grievance.



Where TAP and the complainant agree to the External Review Panel's proposal, TAP will implement the agreed actions or pay appropriate compensation.

Complainants who disagree with the External Panel proposal retain the right to seek alternative grievance resolution outside TAP.







Environmental and social impacts In addition to technical and commercial feasibility studies and preliminary engineering and design work, TAP has conducted extensive studies and consultation to fully understand the Environmental, Social and Cultural Heritage (ESCH) sensitivities of the project. This work has been undertaken to support TAP's assessment of the pipeline's potential impacts on the people and places along its route and to select appropriate mitigations during construction activities.

The project commissioned local and international experts to carry out detailed environmental and social baseline surveys and Environmental and Social Impact Assessments (ESIAs) in Greece, Albania and Italy. These established the existing environmental, social and cultural heritage conditions along the preferred route.

TAP has also conducted a project-wide Cumulative Impact Assessment (CIA, described later in this chapter) to supplement the country-focused ESIAs. The CIA provides a comprehensive assessment of the cumulative impact of the project and external, thirdparty activities in the regions in which it operates, and proposes appropriate mitigation measures.

The level of detail in the country ESIAs exceeds national requirements in all of TAP's host countries and fully meets good industry practice. Each ESIA includes a detailed assessment of the impact of the proposed pipeline route in the country; permanent and temporary infrastructure created during the construction phase, such as access roads and construction camps; and operational facilities that will be in place when construction is completed. TAP conducted extensive stakeholder engagement at each stage of the ESIA process in each country. Overall, across the three countries, TAP held more than 160 meetings with national, regional and local stakeholders between October 2012 and July 2013.

The ESIAs were submitted to the appropriate authorities in each country as part of the regulatory approval procedure for construction and operation of the pipeline. Approval was received in Albania in January 2013 and in Greece and Italy in September 2014. Further amendments have been submitted and approved to support project changes.

Based on the approved ESIAs, TAP developed a system of impact mitigation measures to avoid or minimise environmental or social impacts. Where avoidance is not possible, TAP has identified additional measures to minimise, mitigate, offset or compensate for any potentially adverse impacts.

The impact mitigation measures informed development of the ESCH management plans which are used by TAP to manage TAP's Engineering, Procurement and Construction (EPC) contractors during the construction, operation and ultimate decommissioning phases of the project.

TAP has developed an ongoing programme of supplementary data collection and assessment in the following areas to support implementation of the approved ESIAs:

- Waste
- Biodiversity
- Cultural heritage
- Geohazards

Waste studies

TAP commissioned preliminary waste studies in Albania, Greece and Italy at an early stage of the project.

The studies enabled a better understanding of the types and quantities of waste that construction would generate in each country. They have supported TAP's planning for the handling, storage, disposal or recycling of waste in accordance with European and national legislation and accepted international best practice and have also allowed TAP's EPC contractors to select appropriate waste disposal contractors. To ensure compliance with ESIA commitments and project standards on the handling, storage and disposal of waste in an environmentally responsible manner, TAP subsequently developed a Waste Management Plan. This plan lays out the duties and obligations of TAP's construction contractors in each country regarding waste management. Each contractor has developed a hierarchy of waste management plans to define operational controls that maintain conformance with the applicable standards.

Biodiversity surveys

TAP has conducted a significant number of biodiversity studies to fulfil commitments made in the respective ESIAs. These include studies aimed at providing supplementary information to update and enrich the ESIA data and existing baseline, such as:

- Distribution of endemic fish species in watercourses along TAP's route.
- Identification of early-flowering plants.
- Confirmation of ecologically sensitive sites.
- European ground squirrel surveys.
- Large carnivore surveys.
- Targeted otter surveys.
- Roosting bat surveys.
- Small burrowing mammal surveys.
- Fish surveys.
- Migratory and breeding bird surveys.
- Vegetation and flora surveys.
- Nesting marine turtle surveys.

In Italy, TAP has overseen completion of additional studies for:

- Migratory and breeding birds.
- Amphibians and reptiles.
- Vegetation and flora.
- Olive trees.

TAP has also commissioned offshore surveys of sensitive marine habitats in Italy.

To consolidate specific lender requirements for the identification, classification and prioritisation of mitigations associated with sensitive ecological habitats along its route, TAP undertook a Critical Habitats Assessment and Supplementary Ecological Assessment.

Both initiatives have been supported by the ESIAs and associated field surveys, supplementary field surveys and review of secondary data, and meetings with scientific experts in Greece, Albania and Italy. The assessments also provide the basis for the Ecological Management Plan. Where additional sensitivities are identified, TAP has adopted enhanced mitigation measures proposed by the species experts undertaking the studies, such as refining construction techniques and schedules to minimise any impact on sensitive species.

Additional studies

To maintain the capacity of TAP's adaptive management system to safeguard, rehabilitate and enhance biodiversity, further studies have been and will be conducted before, during and after construction.

These studies will examine all important biodiversity features to ensure that there is no net loss of natural habitat and a net gain for critical habitat (defined as an area of high biodiversity) following the completion of works and reinstatement.



Cumulative impact assessment

The Cumulative Impact Assessment (CIA) assesses the cumulative impact of TAP, its associated facilities and third-party activities in the region, and proposes appropriate mitigation measures.

The CIA:

- Provides complete overview of the project, combining information from the three country ESIAs, the latest design changes, and information that may have been superseded or augmented by later ESIA additions.
- Defines the spatial and temporal influence of the entire project.
- Describes TAP associated facilities upstream and downstream of the project and those associated with its construction over which TAP will have some influence or control.
- Assesses the cumulative environmental and social impacts of the project, including those from TAP's associated facilities, other third-party projects in the region, and external environmental and social drivers.
- Proposes additional measures to avoid, reduce or mitigate cumulative impacts and risks if they were not anticipated in the individual country ESIAs.

Among the CIA's key findings were the mutual advantages to be gained from engaging with the third-party developers of facilities within TAP's area of influence.

Sharing ecological and social data sets, for example, would help enhance the mitigation of impacts from TAP and its associated facilities and help generate further opportunities for positive environmental, social and cultural heritage outcomes.

TAP's approach to the CIA is based on international best practice and associated guidance provided by the applicable lender standards.

TAP's assessment of its associated facilities was based on definitions set out in lender standards, namely:

• Not funded as part of the project.

• Would not have been constructed or expanded if the project did not exist and the project either relies on or exists because of the associated facilities or without which the project would not be viable.

• May be influenced directly or indirectly by the project.

TAP associated facilities are summarised below:

Associated facility category	Applicable projects	
Upstream and downstream associated facilities	Shah Deniz 2 project South Caucasus Pipeline Expansion Project (SCPX) Trans Anatolian Natural Gas Pipeline (TANAP) Snam Rete Gas (SRG)–TAP interconnector	
Interconnectors	Interconnector Greece–Bulgaria (IGB) Ionian Adriatic Pipeline (IAP)	
Regional/local distribution	Connections to DESFA from TAP Greece. Hot water pipeline from CS00 to the municipality of Alexandroupoli. Connections to Albanian gas network from TAP.	
In-country construction and operation phase AFs	New access roads (109.1 km) and upgraded access roads (47.5 km), including 52 bridge upgrades and two new bridges, built to access the working strip and facilities for construction. Third-party-operated aggregate extraction sites, concrete batch plants and waste disposal sites.	

Cultural heritage follow-up

TAP's cultural heritage baseline data, impact assessment, mitigation framework and processes have benefitted from a series of increasingly detailed studies and initiatives, including:

- Fresh data collected where the pipeline had been re-routed and at the planned locations of access roads, construction camps and pipe yards.
- Additional field surveys conducted along the route in each country and the respective local and national government heritage authorities contacted for comment and advice.
- Full integration of cultural heritage baseline data into the project's environmental, construction and mitigation action plans with supporting map data, for use by the TAP project team.
- Engagement of in-country archaeological experts to further refine and implement mitigation works in close liaison with the respective national authorities.
- Establishment of a 'chance finds' procedure for any unforeseen finds, to be handled according to host country national law and the applicable lender standards.

Geohazards

The principal geohazard risks to pipelines include landslides, river erosion and scour, active tectonic faults, soil liquefaction, seismic wave propagation, and ground collapse in karst (e.g. limestone) terrain.

TAP's comprehensive programme to mitigate these geohazards is an ongoing process to support construction. It began with an initial investigation, routing selection, and preliminary engineering in the project's design and planning phase, followed by detailed field investigation and engineering in the detailed design and construction phase.

Following the award of EPC contracts in early 2016, TAP formed a multidisciplinary group of engineers and geologists with internationally recognised experience in the mitigation of geohazards affecting pipelines. This Geohazard Assurance Team provides technical oversight for the investigation and characterisation of geohazards potentially affecting the pipeline and the mitigation of those hazards through routing, engineering design and monitoring.

Discover more about TAP's ESIAs and related studies:

https://www.tap-ag.com/resource-library/reference-documents/esia-documents, where the ESIAs for each country are posted, and https://www.tap-ag.com/resource-library/reference-documents/projectfinance-disclosure.

07 Mitigation

How will any environmental, social, and cultural heritage impacts be handled?

TAP's Environmental and Social Impact Assessments (ESIAs) and supplementary surveys, assessments (including the Supplementary Ecological Assessment and Cumulative Impact Assessment) and plans have rigorously and systematically identified and addressed the environmental, social, and cultural heritage (ESCH) impacts, risks and opportunities associated with the project.

TAP's primary objective is to ensure that potential impacts are either avoided, eliminated or mitigated to an acceptable level and that monitoring is completed to measure mitigation effectiveness and support continuous improvement.

The management controls in the approved ESIAs are included in the Engineering, Procurement, and Construction (EPC) contractors' Environmental and Social Implementation Plans (ESIPs) and construction method statements. The ESIPs provide step-by-step management controls for environmental protection.

A process to manage and monitor EPC contractor performance has been developed to enable TAP to lead the implementation of mitigations that are not controlled directly by contractors. To identify the sensitivities and appropriate controls along the right of way (RoW), a geo-reference register of ecological and social risks and a supporting management process have been developed.

Mitigation hierarchy

The assessment of residual impacts is undertaken after the application of the mitigation hierarchy, below.



Onshore: potential impacts and mitigation

Environmental

A wide range of mitigation measures will be implemented during the pipeline's construction. High-level mitigation may include:

- Seasonal restrictions for high-impact construction activities during sensitive periods for fauna species.
- Reduction of working width through sensitive habitats.
- Trenchless crossing techniques for sensitive watercourses.

TAP is also committed to the international bestpractice management of day-to-day construction activities and potential impacts through measures such as pollution prevention and waste and nuisance management controls.

Route Environmental Impact Register

Locations of important habitats and species are recorded within the Route Environmental Impact Register (REIR), which sets out the primary mitigation measures and required management controls for the construction phase. The REIR is a living document that provides an up-to-date register of wide ranging environmental constraints and required controls to be used during the day-to-day planning and execution of the project. The register feeds information into the EPC contractors' work plans and acts as a verification tool for TAP.

The following sections provide an overview of a range of processes being employed by the project for the mitigation and monitoring of potential impacts.

Air quality and climate

Greenhouse gases

TAP's annual greenhouse gas (GHG) emissions in transporting 10bcma of gas will be approximately 355,000 tonnes of CO2 equivalent. However, if a significant proportion of the gas delivered to Europe replaces more carbon-intensive fuels such as coal or oil in its end markets, a significant overall reduction in GHG emissions would be likely. The table below provides an indicative comparison of GHG emissions:



Gas burned	Energy/power produced (GWh / GW continuous equivalent over a year)	CO2 emitted from thermal power plant based on 0.4t CO2/MWh (million tonnes)	CO2 emitted from coal power plant based on 0.9t CO2/MWh (million tonnes)
10 bcm	45,700 / 5.22	18.28	41.13
		= 0.4† CO2/MWh	= 0.9† CO2/MWh

During the planning, design and preoperations phase, TAP has selected configurations of equipment, operating philosophies and practices to reduce GHG emissions in accordance with the principle of best available techniques (BAT).

GHG emissions will be quantified and reported separately and annually in accordance with the appropriate lender standards.

Dust

Project construction may generate dust through earthworks and transport. The project conducts dust suppression by spraying water on unprotected surfaces where dust-generating activities take place near communities or other sensitive land users. TAP will implement a soil erosion control and reinstatement process to ensure that soil is stabilised and does not become a source of dust following construction.

PRT

At the Pipeline Receiving Terminal (PRT) in Melendugno, near Lecce, gas-fired boilers will be used in the electrical heating system to warm the gas and facilitate its flow, primarily in the start-up phase of operations and during non-standard operating of the system. The PRT will have no emissions during normal operations although the intermittent release into the atmosphere of nitrogen oxides and carbon monoxide may occur if there are interruptions or sudden pressure variations in the Snam Rete Gas network.

At most, the PRT will produce emissions for less than 2% of its annual operating time. Air quality modelling studies by independent technical experts predict these emissions to be within EU and national air quality limits for both the 10bcma and 20bcma scenarios.

Compressor stations in Greece and Albania

The two compressor stations in Greece and Albania will be fuelled by natural gas which is widely accepted to be one of the cleaner forms of energy.

For the initial 10bcma phase of operations, and potential doubling of capacity to 20bcma, air dispersion models predict that emissions will be significantly lower than the accepted levels defined by EU directives and national emission standards. More details of the air quality assessments can be found in the ESIAs.

Acoustic environment

The main sources of elevated noise and vibration during the construction and commissioning phase will be piling, ground improvement or stabilising activities, rock blasting, horizontal directional drilling, hydrotesting and pipeline pigging and drying. In areas where there is a risk of causing a noise or vibration nuisance, TAP will conduct noise and vibration monitoring during construction. TAP will also apply mitigation measures such as the restriction of construction activities to daytime hours and will require contractors to report on noise and vibration prediction and associated control activities.

During operation, the only regular sources of noise anticipated are the compressor stations and PRT. A programme of engineering noise control initiatives supported by noise modelling has shown that noise levels will be within the prescribed limits. Pre-operational and operational monitoring will be undertaken to confirm the noise modelling prediction.

Water resources

The project's largest freshwater needs are related to pipeline hydro-testing to ensure that the pipeline meets operational pressure requirements. Water for hydro-testing will be drawn from local watercourses. Hydro-testing will be split into small sections with a preference to re-use water in subsequent test sections and reduce the overall volume of water abstracted.

The guiding principles of detailed hydrotesting plans prepared for each country will be to limit water abstraction and discharge to surface water sources with larger flows, ensure consideration of seasonal changes, re-use hydro-test water for consecutive pipeline sections, and monitor discharge quality.

Wherever feasible, hydro-test water will be discharged into the same catchment from which it was taken. Measures will also be in place to prevent 'cross-contamination' of any invasive species between different watercourses.

Landscape and soil erosion

Detailed reinstatement and erosion control plans have been developed to ensure the landscape value and stabilisation of the TAP pipeline route. During construction, topsoil is carefully removed and stored until reinstatement.

Following topsoil removal, temporary erosion control measures are installed along the route in areas susceptible to soil erosion.

These areas typically include hills and mountains where rainfall will create scour and erosion if allowed to travel freely along the construction strip.

High-risk areas are identified during preconstruction surveys. Erosion control teams design and install appropriate erosion and sediment control measures after the removal of topsoil. The erosion and sediment control measures are maintained or replaced regularly until the completion of works.

TAP will manage soils carefully during construction and ensure that soils are returned to their previous condition. De-compaction will be performed where necessary and erosion control measures established to facilitate stabilisation and prevent soil loss.

Following replacement of the topsoil, vegetation will be restored as soon as possible to stabilise the soils. In high-risk areas, post-construction erosion control measures will be designed that may combine several different techniques, depending on the situation.

These may include hydro-seeding (a planting process that uses a slurry of seed and mulch and is often employed as an erosion control technique), biodegradable stabilisation matting or engineered retaining structures such earth bunds or rock-filled baskets (known as 'gabions').

Appropriate erosion control during and after construction activities is most important when successfully reinstating the pipeline route back to its previous condition. TAP will monitor the effectiveness of the erosion control measures throughout the operational and decommissioning phases of the project to ensure the integrity of the existing landscape.



TAP will further mitigate landscape and visual amenity impacts by placing screens of trees around and near the compressor and block valve stations.

The project will use materials and colours that help the structures blend with the landscape and will install specially designed lighting to reduce light impacts. The location of these structures in an agricultural setting will further help to reduce landscape and visual impacts.



Natural habitat and ecology

Eighty per cent of the 550km pipeline in Greece traverses highly modified and fragmented agricultural lands, while 60% of the 215km pipeline in Albania crosses agricultural land. These areas are typically of lower ecological value and their restoration will be relatively straightforward after construction work is completed. The largest area of the pipeline route in Italy is characterised by olive tree plantations. Approximately 2,230 olive trees on the pipeline's route in Italy will be moved and stored during construction in compliance with Italian law and standard practice. The trees will be replanted when construction is completed.

For further details of olive tree removal, go to: https://www.tap-ag.com/news-andevents/2017/03/27/tap-italy-gandampa-reolive-tree-removal

Several areas of high ecological value were identified along the TAP route during the ESIA and supplementary ecological assessments. Specific mitigations and management control plans have been developed to ensure disturbance to important ecology is kept to a minimum.

In Greece and Albania, the pipeline route passes through a range of wildlife habitats. The presence of workers and machinery may disturb certain species, especially in more remote areas. This will be minimised by avoiding construction at the relevant pipeline sections during sensitive times, such as breeding or hibernation. The working width will be reduced through natural and semi-natural habitats to limit the disturbance.



Watercourse Crossing Management Plan

Planning & documentation

Implementation Pre-construction work planning and assessment Inspection and awareness sessions Before-after control impact monitoring

Ecological Management Plan

Key principles Compliance with laws and international standards Identification and prioritisation of biodiversity features Avoidance of impacts and prioritisation of mitigation hierarchy

Management & coordination Integration of project and environmental teams EPC contractor self-verification, oversight and assurance Country-specific plans & team capacity building

> Impact identification Before-after control impact monitoring Monitoring and evaluation

Impact management Pre-construction work planning and assessment Reinstatement and restoration Offset management

Compliance & assurance EPC contractor self-verification, oversight and assurance External evaluation RFIR

Erosion Control and Reinstatement Management Plan

Planning & documentation Pre-construction baseline Country-specific plans & team capacity building

Implementation Pre-construction work planning and assessment Engineering and construction oversight

Biorestoration Management Plan

Planning & documentation Pre-construction baseline Liaison with national authorities Country specific plans & team capacity building

Implementation Pre-construction work planning and assessment Inspection and awareness sessions Before-after control impact monitoring

Biodiversity offset strategy

Planning & documentation Residual impact assessment Liaison with national authorities Country-specific plans & team capacity building

Implementation Identification of significant residual impacts Partnerships with implementing parties Development of offset plan

The Ecological Management Plan drives TAP's biodiversity management processes.
CHAPTER 07. Mitigation How will any environmental, social, and cultural heritage impacts be handled?



Ecological Management Plan (EMP)

The EMP has been developed to minimise impacts on wildlife, particularly species of conservation interest.

It is the overarching biodiversity management document that describes TAP's biodiversity management, mitigation and monitoring processes during the construction phase.

The EMP introduces the sub-plans that specify more detailed biodiversity mitigation and management control measures for certain construction activities:

- Watercourse Crossing Management Plan.
- Erosion Control and Reinstatement Management Plan.
- Biorestoration Management Plan.

Each area of high ecological value is included within the Route Environmental Impact Register (REIR). The REIR is used by TAP to ensure compliance with the mitigations required within each area.

To ensure that the existing ecology is restored to its pre-construction condition, each of these areas and important species, along with all other natural habitats, will be monitored throughout the project's operational phase. Habitat loss will occur where permanent and temporary facilities are required, such as the compressor and block valve stations, pipe yards, construction camps and upgraded roads. Woody vegetation will be allowed to re-establish after construction except for the 8m pipeline protection strip. Losses of vegetation will be mitigated by habitat restoration or replacement in compensation areas outside the right of way.

Watercourse crossing

TAP crosses several watercourses in Greece and Albania where construction activities have the potential to disturb river-related ecology.

TAP's Watercourse Crossing Management Plan sets out environmental protection and mitigation measures for specific river crossings.

The plan describes the requirements for all rivercrossing activities, including pre-construction ecological and design considerations, documentation and schedules, construction techniques, reinstatement, monitoring and verification.

To mitigate disturbance, watercourse crossings will be managed using specific management plans to ensure that appropriate controls and mitigations are in place to address environmental sensitivities and that there is minimal disturbance to existing users of the watercourses.



Impacts on flora and fauna at the pipeline's most sensitive watercourse crossings will be reduced by using a trenchless method or by adopting a stringent process of engineering and construction controls, supported by monitoring before, during and after construction.

The remaining watercourses will be open-cut using the following standard mitigation measures to minimise impact to the environment:

- Constructed using isolated methods or during dry bed conditions to prevent downstream sedimentation.
- Restrictions to fuel and chemical handling at watercourse crossings.
- Water quality monitoring to ensure compliance with standards.
- Fauna translocations to safe upstream locations prior to construction activities.
- Careful management of watercourse bed and bank materials.
- Stabilisation and reinstatement of watercourse beds and banks during reinstatement.

Biodiversity Offset Strategy

TAP has developed detailed mitigation and restoration plans to minimise impacts to biodiversity. However, some residual impacts may remain.

Long-term post-construction monitoring will assess the effectiveness of impact minimisation and restoration. Where residual impact cannot be avoided, the Biodiversity Offset Strategy will be implemented to ensure no net loss of natural habitat and a net gain for critical habitats of high biodiversity value.

This strategy sets out TAP's longerterm actions to monitor the success of construction management controls and biorestoration. It addresses any residual impacts on biodiversity, focusing on species and habitats identified as priority biodiversity features or critical habitat.



Biodiversity Action Plans

Following the reinstatement of sensitive habitats, TAP will develop Biodiversity Action Plans (BAPs) for each host country and the offshore section of the pipeline route. These plans will provide a detailed roadmap for the long-term management and monitoring of each of the priority biodiversity features identified in the Biodiversity offsets Management Plan (BMP).

Development of the BAPs will involve national and local stakeholder engagement and the cultivation of longterm partnerships with appropriately experienced in-country organisations that would support implementation of the specific plan activities.

Habitat loss will occur where permanent and temporary facilities are required, such as the compressor and block valve stations, pipe yards, construction camps and upgraded roads. Woody vegetation will be allowed to reestablish after construction except for the 8m pipeline protection strip. In compensation areas outside the right of way, losses of vegetation will be mitigated by habitat restoration or replacement.

Waste management

TAP applies a waste hierarchy that prioritises recycling and reuse on all possible waste streams. The project is committed to handling, storing and disposing of project-generated waste in an environmentally responsible manner and in accordance with national and EU legislation. This includes:

- Forecasting the type and volume of waste that will be produced.
- Segregation and storage of waste streams in accordance with national and EU standards.
- Due diligence and audits of waste disposal third-parties and sites to ensure compliance with national and EU standards.
- Waste monitoring and compliance assurance programmes to monitor project performance.

In line with the above commitment, TAP has adopted a waste management hierarchy that preferentially avoids or minimises waste generation at source, reduces its harmfulness as far as reasonably practicable, and reduces the quantity of waste disposed to landfills or other final types of disposal. TAP's oversight and assurance process includes assessment of waste facilities, daily assurance monitoring, monthly inspections and oversight reporting.



Social and economic

TAP's Social Impact Management Plan (SIMP) provides the framework for management of the project's social impacts. The SIMP identifies the likely scale and nature of potential impacts in relation to land access, livelihoods, and construction activities.

The SIMP is updated as the project progresses to reflect any changes in, for example, the construction schedule, the broader social environment, or the nature of social impacts at different project stages.

The integration of TAP's social impact management programmes with the SIMP ensures consistent and effective mitigation of social impacts throughout the project. These programmes include:

- Land and Easement Acquisition (LEA) programme
- Livelihood Restoration Programme (LRP)
- Route Social Impact Plan (RSIP)
- Grievance management mechanism

TAP's social management programmes address specific impacts, target populations and geographies. They are designed to be mutually reinforcing, particularly where impacts occur at different levels or affect different populations.

Land and livelihoods

The land required by TAP generally represents a relatively small proportion of affected landowners and users' holdings. However, agriculture in the regions traversed by the pipeline route consists primarily of smallholdings. Project construction and any accompanying road and infrastructure disruption may also impact regional businesses, agricultural employment and livelihoods.

TAP recognises that compensation alone may not guarantee the restoration or improvement of living standards. To ensure that the livelihoods of those affected by the project are fully restored and, where possible, improved, additional agricultural assistance measures are implemented through TAP's livelihood assistance and transitional support programme (LATS) and a land productivity monitoring programme.



The LATS programme aims to restore and, where possible, strengthen the livelihoods of affected households within the project RoW.

LATS is designed to ensure the successful reinstatement of temporarily leased land to affected owners and users for re-cultivation, monitor households affected by permanent land-take, and provide targeted livelihoods assistance.

It also provides transitional support to affected people considered vulnerable to the effects of land easement and acquisition

Following completion of construction, the project prepares Site Reinstatement Plans (SRPs) to direct the reinstatement and planting at each site on the pipeline route. These plans guide the restoration of the natural resources and associated livelihoods of landowners and users to pre-construction conditions (see Chapters 7, 10 & 11 for further details).

The RSIP complements the ESIAs and associated management plans to deliver effective treatment of social impacts. It provides additional assurance by identifying and addressing impacts that may not have been anticipated during the pre-construction phases of the project or mitigated through the LEA and LRP programmes.

The RSIP identifies all assets and businesses that may potentially be impacted by construction activities, assesses risks associated with those sites, and determines the need for further assessment, engagement and mitigation. It also helps to coordinate the actions of TAP and its EPC contractors: for example, impacts on farms outside the RoW may be mitigated by a range of measures, including construction management (such as a reduced working strip and dust suppression), provision of livelihood assistance, and compensation if required.

Grievance Management

Planning & documentation Grievance management tool Grievance framework and country plans

Dedicated resources Community and household roll-out Training of contractor staff

Stakeholder Engagement

Planning & documentation Identification of stakeholders Confirmation of engagement methodologies Stakeholder engagement strategy and country plans

> Dedicated resources Tailored engagement strategie

Social Impact Management Plan

Key principles

Compliance with laws and international standards Minimisation of impacts and prioritisction of livelihoods of affected households Effective identification and mitigation of all impacts

Management & coordination

Integration of project and social management functions EPC contractor self-verification, oversight and assurance Country-specific plans & team capacity building

Impact identification Baseline and pre-construction surveys External stakeholder engagement Monitoring & Evaluation

Impact management

Stakeholder engagement Construction impact management Livelihood restoration and improvement Compliance & assurance

Internal & external Monitoring & Evaluation Audits Reporting

Social and Environmental Investment

Social & Environmental Investment Plan Identification of partner organisations Participatory project identification

Engagement & partnership agreements Implementation & follow-up

Land & Livelihoods

Land acquisition & compensation principles Land & easement acquisition plan Livelihood restoration plan

Owners and users of land compensated by agreement Livelihood assistance provided Transitional support for identified vulnerable households

The SIMP provides a framework for managing TAP's social impacts.

Residual impacts

TAP has made every effort to minimise impacts to assets and businesses outside the pipeline's RoW, including careful routing and appropriate mitigation measures during construction. But some residual impacts may affect certain structures and business operations due to their proximity to the RoW, access roads, and other project infrastructure.

All residual impacts are identified through TAP's Route Social Impact Register (RSIR), a living document that identifies potentially affected assets, gathers information and prioritises follow-up action.

Infrastructure, utilities and public services

The pipeline route through Greece, Albania and, to a lesser degree, Italy will cross infrastructure and utilities such as roads and irrigation channels. Crossing activities will lead to temporary inconvenience for road users.

The project makes agreements with public or private owners for all infrastructure crossings. It ensures that works are carried out in consultation with local municipalities and regional agencies, communities are notified of construction activities, and disturbance minimised.

TAP Social Field Monitors (SFMs) are present at work sites to verify that disruption is minimised and managed properly.

Community health and safety

Any large infrastructure project poses potential public health and safety risks in neighbouring communities. TAP recognises its duty of care and is committed to the health and safety of its host communities.

The main risks during construction are associated with increased transport in the project's pipeline and logistics corridors, construction operations, and public access to the RoW. TAP and its EPC contractors address risks to community safety through a range of measures including Traffic Management Plans (TMPs) which determine project transport routes and scheduling, seeking to mitigate risks to individuals, groups or communities at particular risk.

Other initiatives to avoid and mitigate impacts include:

- Driver training.
- Intensive monitoring of driving standards through In Vehicle Monitoring Systems (IVMS).
- Signage in construction areas.

The project also conducts early and ongoing consultation and safety awareness with local communities, schools and other social service providers.

EPC medical crews, first aiders and ambulances provide assistance to community members where necessary.

TAP has developed Emergency Response Plans (ERPs) in consultation with national emergency providers and local healthcare facilities. These plans cover all EPC contractors and subcontractors.

Community cohesion

TAP addresses community cohesion issues by ensuring a fair and equitable distribution of project benefits and opportunities. This includes:

- An extensive programme of stakeholder and community engagement, ensuring that communities are aware of the project, its likely impacts and impact management measures, and project benefits (see Chapter 4 for further details of TAP's stakeholder engagement activities).
- Attention to the needs of particularly vulnerable groups and individuals.
- Transparency and equity in local employment.
- Proactive recruitment and sourcing of goods locally, wherever possible.
- Management of land issues through the LEA framework.
- Commitment to optimising any project benefits through infrastructure enhancement, local content and the delivery of a social and environmental investment (SEI) programme (see Chapter 4 for further details).

Traffic and transport

Road traffic generated by construction activities will be substantial in more isolated areas, adding to existing low-level traffic flows. Road conditions and road network capacity in project regions are generally good, but less so in Albania.

TAP and its EPC contractors consulted regional and local administrations and agencies, including traffic police, in developing the traffic management plans mentioned earlier. The plans cover all construction activities, determine logistics routes and dictate transport scheduling and driver standards. They aim to promote community safety and minimise any disturbances, delays and traffic risks.

Worker management and rights

The project's construction workers come from different regions, cultures and social backgrounds, and possess different levels of skill.

TAP has included social clauses in its EPC contracts, requiring EPC contractors to ensure fair treatment of workers, a safe work site environment, and decent accommodation and catering. This conforms with TAP policies and relevant lender standards.

TAP has put an Industrial Relations Management Plan into effect that is designed to ensure that the project's contractors manage employee and industrial relations responsibly and properly. This includes fostering positive employee relations; supporting workforce safety, health, capability, and staff motivation; developing effective tools and processes to minimise work disruption; and implementing TAP's project standards, Code of Conduct and best practice.



Onshore cultural heritage

Ground disturbance and excavations for the pipeline and other project components present potential risks to cultural heritage in the pipeline construction strip. TAP is committed to the protection and preservation of cultural heritage values in all the regions in which it operates.

The project ensures that all cultural heritage management work undertaken complies with the commitments made in the respective ESIAs, Host Government Agreements (HGAs), and applicable lender standards.

Measures for the mitigation of any cultural heritage impacts in all three countries include:

- Completion of baseline studies, working with local cultural heritage experts, which guided route selection, leading to avoidance of cultural heritage sites wherever feasible.
- Reduction of the working strip (i.e., the area of direct ground-disturbing impacts) where construction activities were necessary within or close to archaeologically sensitive areas.
- Completion of post-ESIA walkover surveys to supplement the baseline data and identify additional cultural heritage sites ahead of construction.
- Evaluatory trial trenching to characterise sites or areas of notable sensitivity in advance of construction.
- Close liaison with national authorities to agree excavation and recording methods and post-excavation requirements.
- The setting of fencing and/or signage near known cultural heritage sites to prevent inadvertent disturbance by construction crews.
- The careful removal of archaeological remains through professional excavation and associated studies, led by national and regional experts.
- The design and implementation of site-specific lowimpact construction techniques, in consultation with national authorities, where avoidance is not feasible.
- Implementation of country-specific Cultural Heritage Management Plans (CHMPs) describing planning and construction methods employed to minimise damage to cultural heritage, cooperation with national-level stakeholders, monitoring of all ground works, and 'chance finds' procedures. These country-specific CHMPs align with applicable national legislation, the respective HGAs and relevant lender standards.

Greece

The project team in Greece has worked closely and effectively with national authorities in Athens and at each of the 13 regional agencies (ephorates: local administrative and research units of the Ministry of Culture and Sport) to design and implement relevant and respectful archaeological studies.

The implementation of planned excavations has been led by the respective ephorates directors, using local specialists for field studies and conservation. Up to 750 archaeologists and archaeological workers at a time have worked on the project as part of the largest archaeological programme ever required from a private project developer in Greece. So far, the project has undertaken more than 20 large-scale excavations and 105 small rescue excavations through to August 2017.

In implementing this programme, the TAP team in Greece is working with the Ministry of Culture and Sport, enhancing the standard for privately sponsored archaeology programmes in the nation and providing extensive new data for the ephorates' future research and interpretation programmes.

The project has also established a 'chance finds' procedure for any unforeseen finds, which are handled according to Greek national law and the applicable lender standards.

A sizeable percentage of the pipeline route remains to be constructed in Greece, much of which passes through Western Macedonia, an area less well known to archaeologists. The TAP team in Greece is working closely with the authorities in this region to plan the archaeological works, complete supplementary walkover surveys, and excavate many trial trenches to identify archaeological sites ahead of construction.

The archaeological excavations in this area have the potential to greatly expand archaeologists' knowledge of this mountainous region and enhance the capacity of regional authorities to plan for future development projects.

Albania

The project has worked closely with national-level cultural heritage experts and the relevant authorities in Albania for several years during the completion of extensive baseline surveys. These efforts have allowed TAP to avoid many known cultural heritage sites when routing the pipeline, new access roads and associated facilities.

To date, extensive excavations have been required for previously known sites that could not be avoided, sites revealed by construction activity, and seven previously unknown sites. These excavations are being conducted by regional and national experts under the supervision of national authorities and TAP's cultural heritage team.

TAP's CHMP for Albania sets out the requirements for dealing with known cultural heritage during construction and includes a 'chance finds' procedure. Any finds will be handled in accordance with Albanian regulatory requirements and applicable lender standards.

Italy

Baseline evidence suggests a somewhat more limited archaeological risk in Italy. Most currently known cultural heritage indicators within or near the pipeline route are associated with rural buildings (barns and small houses), drystone walls and scatters of pottery fragments.

The presence of pottery scatters indicates the potential discovery of previously unknown sites during advance evaluation work and subsequent construction ground works. The TAP team in Italy will work closely with local authorities if previously unknown cultural heritage sites are revealed during construction.

Offshore impacts and mitigation

Environmental

The project's key impacts on the marine environment relate to the loss of, or disturbance to, seabed habitats, increased water turbidity levels due to temporarily increased suspended sediments, smothering due to sediment re-deposition, and underwater noise.

With the potential to affect sensitive 'benthic' (in or on the ocean floor) habitats and species, fish, marine mammals and turtles, these impacts are predominately associated with seabed intervention works during construction from activities including dredging, trenching, back-filling, sheet piling installation, pipe laying, pipeline protection and anchor placement.

Dredging involves the movement and relocation of seabed sediments. As they are released into the water column they become suspended in a plume, increasing turbidity and potentially smothering benthic species when the sediments are re-deposited from the plume.

In Albanian shallow nearshore waters, dredging is required to facilitate the access of works vessels during construction and to ensure that the pipeline is buried at a sufficient depth to secure and prevent it from being influenced by the natural movements of sediments at the landfall.

In Italian nearshore waters, minimal dredging will be necessary due to the use of a microtunnel at the landfall to mitigate any impacts on nearshore and coastal habitats. Increased turbidity and smothering due to re-deposition of suspended sediments can cause issues for sedentary filter-feeding species like sponges and species such as seagrasses that require light to photosynthesise.

In addition to the use of a micro-tunnel to mitigate impacts, TAP is undertaking extensive nearshore monitoring and mitigation in Italian waters to address issues associated with suspended sediment release during construction. Further offshore, the pipeline installation will not involve dredging. Physical disturbance will be limited to placement of the pipeline on the seabed from a vessel, anchor placement and, in some limited areas, the placement of concrete, steel or rock structures - for example, to cross existing cables and pipelines, or to avoid sediment being scoured from underneath the pipeline.

Most impacts on the seabed and water quality are short-term, temporary and reversible. The only long-term impact is habitat loss within the direct footprint of the pipeline and, in some places, the direct footprint of its supporting structures. Mitigation measures will be applied to avoid or minimise impacts on sensitive benthic habitats.

Temporary sheet piling will be installed at both landfalls as part of the construction works. In Albania, this will take the form of a temporary cofferdam and in Italy it will be one of the mitigation measures at the microtunnel exit point to reduce the volume of sediment released and its impact on seagrass. The piling works in nearshore and intertidal areas produce underwater noise which has the potential to impact fish, marine mammals and turtles.

Assessment modelling of underwater noise impact has been undertaken to inform TAP's assessment and mitigation of the potential impacts on fish, marine mammals and turtles. The most significant noise and vibration impacts will be generated during the cofferdam installation works in Albania. These will occur for a longer duration than the more limited piling works at the micro-tunnel exit point in Italy.

TAP will produce a Marine Mammal Mitigation Protocol (MMMP) to mitigate and manage underwater noise impacts. This will also benefit turtles and fish. Trained marine mammal observers will be present during all piling work. If seals or cetaceans (i.e. whales, dolphins or porpoises) are sighted nearby, work will not begin (or will be suspended) until they have naturally vacated the area.

Landfall construction activities are scheduled to occur outside the turtle breeding season and turtle surveys will continue to ensure that any vulnerable breeding sites are identified and appropriate mitigation taken. In Albania, a review of available literature on turtle nesting sites and discussions with country subject-matter specialists confirmed the absence of nesting turtles at the landfall site. This has been confirmed by TAP undertaking a specific survey from July to September 2017.

TAP's Italian ESIA states that very occasional turtle nesting has occurred on or near the Italian landfall. Intertidal works in Italy will involve constructing the micro-tunnel to connect the offshore and onshore pipeline sections, thus avoiding significant impacts on these beaches.

TAP is undertaking ongoing environmental, ecological, and biodiversity specific monitoring to inform the adaptive mitigation and management plans that address project impacts. Mitigation activities planned, in addition to marine mammal observers, include preferred vibro piling techniques that underwater noise modelling has predicted will trigger only weak behavioural reactions if species are present, and a 'soft start' approach to ensure that noise levels build up gradually to minimise exposure and alarm.

Offshore cultural heritage

Potential sources of impact on cultural heritage offshore (primarily shipwrecks) can result from seabed disturbing activities, such as landfall preparation, sediment removal and trench excavation, pipelay, and anchoring.

Planning efforts have included the completion of a series of pre-construction surveys, using 'remote sensing' to identify possible underwater archaeological sites. The data collected during these surveys were reviewed by professional archaeologists and an initial plan to avoid underwater sites was prepared to guide construction.

Construction-phase avoidance and protection measures for cultural heritage will include additional pre-construction surveys of the final selected pipeline installation corridor, archaeological monitoring, the implementation of a 'chance finds' procedure with a professional archaeologist to supervise works, and the use of a 'stop work' protocol if a previously unknown site is identified.



Geohazards

A geohazard is a geological state that may lead to widespread damage or risk. TAP's Geohazard Assurance Team (GHAT) provides technical oversight for the investigation of geohazards potentially affecting the pipeline and their mitigation through routing, engineering design and monitoring.

Involving GHAT where relevant, TAP has refined the route with an emphasis on avoidance of geohazards and, only after exhausting such opportunities, relying on mitigation where possible.

Landslides

Landslides are the primary geohazard for pipeline construction in mountainous terrain. TAP strictly applies best international mitigation practice by:

- Avoiding cutting into steep slopes.
- Ensuring that permanent stabilisation and drainage measures are constructed where cuttings are required, with adequate provision for maintenance.
- Avoiding pre-existing landslides.
- Maximising the use of stable ridgelines and plateaus with burial in a sufficiently deep trench.
- Transitioning to higher or lower elevations with steep ascents and descents along stable spurs or following the slope fall line to minimise exposure to landslide risk.
- Using bank protection as needed to ensure that watercourses will not undercut slopes and cause instability.

River crossings

In cross-country pipeline construction, river crossings present the highest geohazard risks. The project ensures that river crossings are installed outside and below the active scour/ erosion zone and will be monitored and maintained throughout the operational life of the pipeline.

TAP has commissioned river crossing designs by experienced engineers working with hydraulic scientists and fluvial geomorphologists (experts on the form and function of streams and their interaction with the surrounding landscape).

The GHAT river crossings specialists worked with TAP's contractors to survey all river crossings; confirm the feasibility of crossing locations; assure proper classification and the applicability of the designated standard design; and review major crossings to assess design requirements or confirm preliminary plans.

GHAT is conducting ongoing field reviews during construction to assure the integrity of each river crossing and assist in developing monitoring and maintenance plans.

In total, there are 84 major river crossings on the TAP route: 62 in Greece and 22 in Albania.

Geological faults

Faulting that results in surface rupture is an important consideration for buried pipelines that cross fault zones. TAP and its contractors have conducted investigations in Greece and Albania to identify and characterise active faults intersecting the pipeline alignment. GHAT has also conducted field visits alongside contractors' geologists during their investigations and trenching.

At fault crossings, in accordance with best international practice, the pipeline will be constructed in a shallow trench and backfilled with loose granular material (typically sand, gravel or uniform graded crushed rock). The trench will be excavated with sufficient width to permit the pipeline to displace within the backfill to accommodate any abrupt displacement in the ground surface.

Soil liquefaction

Soil liquefaction occurs when seismic waves pass through saturated or part-saturated soil, causing it to lose strength and stiffness and behave like a liquid. Damage to pipelines may occur when liquefaction leads to large ground displacement.

The liquefaction hazard to TAP is highest in the flat agricultural areas of western Albania and the low-lying agricultural areas in the first 50km of the route in western Greece.

The project conducted preliminary seismic hazard assessment during the FEED phase. This examined potential seismic sources, magnitudes and estimated ground motions for 475-year and 2,475-year earthquake return periods along the pipeline route, as required by international building codes. Analysis of each site's dynamics was then conducted.

In Greece, owing to the extent of the liquefaction hazard, the project conducted supplementary studies in accordance with European standards for the design of structures for earthquake resistance (Eurocode 8). The refined analysis resulted in an overall reduction in the assessed liquefaction hazard.



The pipeline will be buried with sufficient soil cover to compensate for the possibility of movement caused by liquefaction. The stress on the pipe associated with this phenomenon is assessed as not significant and well within the limits of the applicable code.

The lenght of the pipeline in Albania potentially affected by so called 'buoyant rise' of the pipe is one to

three kilometres and will be addressed either by the installation of anchors or, as in Greece, by appropriate trench depth and soil cover.

Seismic ground motion and wave propagation effects

Seismic wave propagation is a phenomenon by which primary and secondary energy waves spread radially from the source of an earthquake into the surrounding rock and soil.

A pipeline buried in soil that is subject to the passage of ground waves will experience longitudinal and bending strains. TAP's contractors have calculated these potential strains and concluded that the pipeline's design will withstand the effects without damaging its integrity.

Karst

Karst is a landscape formed by the dissolution of soluble rocks, including limestone and dolomite, by underground water. It usually features barren, rocky ground, caves, sinkholes, underground rivers, and the absence of surface streams and lakes. The potential for ground collapse poses a recognised threat to pipelines.

Geological specialists conducted a karst hazard review for each country which was then reviewed by GHAT. The risk in Greece and Albania is considered low and generally avoided by TAP's route. There are no specific localities where mitigation is required.

The geohazards analysis also considered environmental sensitivities to ensure that the final crossing method is acceptable.

Cumulative impacts

TAP's Cumulative Impact Assessment (CIA) process aims to identify and, where possible, eliminate or minimise adverse environmental or socio-economic impacts from the project and its associated facilities. It identifies risks to valued environmental, social and cultural components, including:

- Physical features, habitats, wildlife populations (e.g., biodiversity).
- Ecosystem services.
- Natural processes (e.g. water and nutrient cycles, microclimate).
- Social conditions (e.g. health, economics).
- Cultural aspects (e.g. traditional spiritual ceremonies).

The CIA distinguishes between management of significant cumulative impacts associated with the project – where TAP has control over mitigation and management – and those outside TAP's supervision where other projects are the main cause.

TAP's CIA sought the sources of impacts within 20km of the pipeline's onshore route and 50km of its offshore route. The following impact sources were considered in the CIA:

- Current third-party projects:
- Recently constructed operational DESFA gas pipeline, which shares the TAP corridor for some 230km in Greece.
- Egnatia motorway and connecting national roads in Greece.
- Existing wind farms in Greece.
- Operational Patos Marinza oilfield in Albania.
- Associated project facilities.
- Reasonably defined or foreseeable third-party projects: 17 in Greece, nine in Albania, and 11 in Italy. These include developments such as photovoltaic stations, wind farms, hydropower plants, irrigation dams, and roads.
- Developments or activities induced by TAP, such as improved connections to remote areas and rivers following access road construction.
- Other sources of human and natural stresss, such as industrial development, urbanisation, hunting, fishing, soil erosion, energy and mining, transport and tourism.

As part of the CIA, TAP undertook external consultation with government agencies, nongovernmental organisations and research organisations in all three countries with 31 participants in total.

Mitigation of cumulative impacts

The CIA identifies additional mitigation measures to be implemented both by TAP and in collaboration with other project developers, operators and/or government agencies to reduce potential cumulative impacts. Many of TAP's project-specific mitigation measures identified during the ESIAs also address cumulative impacts or will reduce TAP's contribution to a potential cumulative impact.

Key management strategies to address some of the cumulative impacts identified in the CIA include:

- An ongoing social and environmental investment strategy to assist communities (see Chapter 4).
- A Greenhouse Gas Management Plan, in development for the operational phase, to discuss best available techniques, greenhouse gas monitoring, reporting and targets, and control measures during operation.
- Further consultation to explore data sharing, joint monitoring and engagement activity to leverage the combined capacity of TAP and other organisations.

Transboundary impacts

The project has discussed transboundary project impacts with, and submitted official notifications to, the Italian, Albanian and Greek environment ministries in line with the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991). Turkey is not a signatory to the convention.

The potential for transboundary impacts associated with crossing the Evros river on the Greece-Turkey border will be greatly minimised by using a trenchless crossing technique and a site-specific hydro-testing plan. Assessment revealed no potential transboundary impacts between Italy and Albania associated with hydro-testing. During operations, the main potential source of transboundary impacts from Greece to Turkey is the compressor station located approximately 3.2km from the border. However, the project's air dispersion and noise propagation modelling have shown that no significant transboundary effects are anticipated.

The envisaged compressor station in Albania for the 20bcma capacity expansion case will be about 4km from the Greek border. Project modelling indicates no meaningful transboundary air quality impacts or visual impacts towards Greece.

Non-regular operation and unforeseen events

Modern gas transportation is considered very safe because of the high levels of European and international safety standards and the use of established state-of-theart technology. TAP has been designed in accordance with these national and international standards.

TAP minimises risks from non-routine events through pipeline routing and the technical design of the pipeline and associated infrastructure. This includes pipeline safety distances to settlements and populations; pipeline integrity protection and leak detection systems; and regular maintenance and inspection.

The project safety measures for the offshore pipeline will include corrosion protection and the prevention of damage from third-parties such as fishing and marine traffic. Regular maintenance and inspection will monitor the integrity of the offshore pipeline.

Emergency Response Plans for the operational phase, compliant with national, international and EU requirements, will be in place to manage response planning in coordination with the relevant state organisations and external stakeholders.

Discover more about TAP's mitigation activities:

https://www.tap-ag.com/resource-library/referencedocuments/project-finance-disclosure



How will communities benefit from the project?

During construction, there will be some disruption to the lives, livelihoods and environments of the diverse communities on the pipeline route.

TAP is committed to mitigating these impacts and delivering benefits to people affected by the project. To address the specific social and environmental needs of these communities, TAP has established a comprehensive Social and Environmental Investment (SEI) programme.

The project also provides important employment, training and business development opportunities during the construction phase.

As citizens of TAP's host countries, the project's neighbours also stand to gain from the wider benefits that will accrue to Greece, Albania and Italy from the pipeline's presence. Both direct and indirect, short-term and long-term, these range from the macro-economic to specifically local benefits and opportunities.

Social and environmental investment

Social investment has been defined as voluntary contributions or actions by companies that help communities in their areas of operation to address their development priorities and take advantage of opportunities created by private investment in ways that are sustainable and support business objectives. TAP's SEI programme seeks to contribute in a sustainable and inclusive way to improved livelihoods and quality of life in communities in proximity to the pipeline. Based on extensive dialogue with local communities, TAP focuses the programme on:

- Strengthening livelihoods.
- Supporting improved community quality of life.
- Enabling improved skills and abilities through support for education and training initiatives.
- Enhancing environmental management including through support for biodiversity.

The SEI programme is implemented by country offices based on a TAP-wide social investment strategy. It reflects TAP's commitment to Corporate Social Responsibility (CSR), underpinned by TAP's Code of Conduct and adherence to the applicable national and lender standards.

The SEI core principles are:

- Inclusiveness: enabling equal opportunities for all. This includes supporting gender equality, the equitable involvement of ethnic and religious groups, and proactive consideration of vulnerable groups.
- Participation: enabling participative communitylevel involvement in the design and development of SEI projects and associated decision-making.
- Capacity strengthening: building human and social capital through targeted activities to develop the skills of specific individuals and groups.
- Leveraging local assets: identifying, building and mobilising the assets and strengths that already exist within a community, rather than being focused solely on needs
- Sustainability: seeking to avoid dependency, encourage self-reliance, and create long-term benefits that can outlast company support.

Recognising that no single project can meet all the objectives of the SEI, TAP supports a portfolio of projects that together address the programme's aims while considering the following country-specific issues:

- Allocation between geographies.
- Need to demonstrate commitment on the ground in those areas impacted by construction.
- Implementation models selected in that country.
- Diversification to support relationships with a range of stakeholders.

Budget

The committed budget for TAP's SEI programme is:

- Italy €12,000,000
- Albania €14,000,000
- Greece €32,000,000

SEI implementation

Greece

TAP has worked with regional governors and municipal mayors to agree local and regional SEI priorities and budget distribution.

The project has held more than 340 stakeholder meetings to further refine areas of common interest for TAP's SEI investment. TAP also discusses SEI investments with the national government.



TAP has identified four priority areas:

- **Small grants:** a collaborative programme with the Network for Social Solidarity under the auspices of the Federation of North Greece Industries. This partnership continues to make donations in line with community need.
- Infrastructure: supporting municipalities to implement infrastructure-linked initiatives addressing communal quality of life – such as improving parks, playgrounds, community centres, and local markets – and larger community objectives, such as improving water and waste management systems and expanding or upgrading farmland irrigation systems.
- **Thematic programme:** TAP will provide a range of equipment that is currently lacking due to the country's ongoing economic problems. This includes medical emergency, waste disposal and rescue vehicles.
- **Capacity building:** medium and long-term opportunities in sectors relevant to TAP's primary stakeholder constituencies. TAP country offices will work on initiatives ranging from agricultural production to vocational training and education

Albania

TAP has engaged with stakeholders to understand community needs and development priorities. This engagement has included surveys, focus groups, government and NGO meetings, and analysis of government development planning.

This engagement indicated that unemployment and livelihoods were the highest priority community needs, followed by access to water and sanitation; access to infrastructure; education; and the environment (waste and pollution). At regional and municipal levels, the highest priority development interventions were improvements across the agricultural sector.

Priority SEI investment areas in Albania are:

- Livelihoods in the agriculture sector.
- Community infrastructure, including schools and water supply.
- Education and training, including internships and energy sector vocational training.
- Community safety, including access to medical supplies and awareness raising.
- Emergency equipment and donations; in response to cold weather, for example.

The not-for-profit sector in Albania has the capacity to work with TAP, having been the beneficiary of funding from the European Union, various governments, and development agencies.

Italy

TAP Italy has undertaken an extensive needs assessment to understand community development priorities and how TAP can best respond. An in-depth analysis conducted by the project integrated the findings of studies carried out by third-party research agencies with the outcome of TAP stakeholder engagement consultation. To date TAP has held approximately 600 SEI related meetings in Italy.

Project impacts are primarily in the Melendugno municipality. The area has high unemployment, especially among young people. Economic activity is predominantly small family-run businesses in tourism, services, agriculture and fishing.

The potential risk of environmental damage and the impact on tourism from TAP's activities are among the most important local concerns. Public infrastructure and transport links are poor. Survey data highlighted a strong desire for TAP SEI to be focused locally with a high level of involvement from local institutions and citizens.

Priority investment areas in Italy are:

- Livelihoods, with a focus on the tourism, agriculture and fisheries sectors.
- Environmental management, focused on tourism, agriculture and the marine environment.
- **Community quality of life**, particularly services and infrastructure.

Initiatives currently under way include working with the University of Salento to improve the local marine environment, a small grants programme, and building the capacity of the tourism sector through, for example, professional training for local restaurant businesses, English language and information and communication technology (ICT) courses for local unskilled citizens, and a project to support development of the fishing community in San Foca. In August 2017, TAP was invited to attend the interinstitutional Roundtable for Social and Environmental Investments which considers SEI proposals and plans their implementation.

Other host community benefits

Communities that live on TAP's pipeline route will enjoy both local and wider national benefits from construction and operation of the pipeline. Both direct and indirect, short-term and long-term, these benefits range from the macro-economic to specifically local.

Greece, Albania and Italy will benefit strategically from the presence of TAP, enhancing their status on the European energy map as regional gateways and energy hubs.



Independent studies conducted in these countries suggest that TAP will have a positive impact on the economic development of each country, especially during the construction phase.

Greece

A study by the Foundation for Economic and Industrial Research (IOBE) to assess the economic benefits of the project in Greece has estimated a workforce of 2,700 for the main construction phase, in line with TAP's own employment monitoring. Around 20 to 30 people will be employed in the permanent pipeline system and station operation workforce.

The generation of employment and business opportunities locally will also help foster the transfer of knowledge and skills to local firms and workers.

TAP will also be a source of direct foreign investment to Greece.

Albania

The construction workforce for the project in Albania is around 1,500. The permanent pipeline system and station operation workforce will be an estimated 20 to 30 people.

TAP will facilitate the development of Albania's energy infrastructure and help attract foreign investment to the country. The project is one of the largest foreign direct investments in Albania to date.

The pipeline will help the commercial, physical and political integration of Albania with Europe, increasing the country's regional and geo-strategic significance while promoting continued economic stability and predictable annual tax revenues. TAP could also support Albania in meeting its own domestic energy needs by helping to develop an internal energy market.



Albania is already benefitting from the building and upgrading of access roads and bridges to facilitate the pipeline's construction.

Italy

An independent economic impact assessment in Italy (Nomisma Energia, 2012) suggests that during the first four years of the pre-construction and construction phase in the Puglia region TAP will directly support 150 full and part-time jobs, with another 640 full and part-time indirect jobs coming through local companies working for the project.

When TAP comes on stream, permanent staff will be required at the Pipeline Receiving Terminal to monitor local daily operations and operate the entire pipeline. For the operation phase of about 50 years, TAP will directly support 32 jobs as well as 150 indirect jobs per year, part-time and full-time.

Lifetime revenues generated by the project are likely to have a positive impact on the economy, with long-term local tax payments to Melendugno municipality of approximately half a million euros a year.

Discover more about TAP's community benefits:

https://www.tap-ag.com/our-commitment/ to-the-future and https://www.tap-ag.com/ resource-library/reference-documents/projectfinance-disclosure

79 TAP route selection

How was the route chosen?

Pipeline to bring gas from the Caspian to Europe

Shah Deniz 2 (SD2) is a gas field in the Caspian Region. There were two alternative destinations for delivery of its gas to Europe, each with two associated alternative routes:

- Southern Italy:
 - Extension of the existing Turkey–Greece gas interconnector into Italy, or
 - TAP
- Baumgarten, Austria:
 Nabucco West pipeline, crossing Bulgaria, Romania and Hungary, or
 South East Europe Pipeline, through Bulgaria, Romania, Hungary and Croatia.

In 2012, the Shah Deniz consortium reduced the four potential routes to two: TAP as the priority pipeline route to Italy and Nabucco West for the route to Austria. In June 2013, the consortium selected TAP as the preferred route for transporting Caspian gas to Europe.

Approach to route selection

The final TAP pipeline route chosen has been guided and supported by a systematic and rigorous process of environmental, social and cultural heritage (ESCH) baseline surveys and stakeholder engagement. The approach has been progressively more focused, moving from macro to sitespecific issues, and has involved external stakeholders including government authorities, communities, individual households, technical and scientific advisors and the construction contractors.





The TAP corridor was identified using an iterative route selection process with the following general approach:

- 1. Identification of a search area.
- 2. Identification of potential macro route corridors within the search area.
- 3. Selection of preferred routes within the macro corridors.
- 4. Identification of the final route during the conceptual design, front end engineering design (FEED), and detailed design stages.



The final route identified a 38m-wide construction strip in Greece and Albania and a 26m-wide corridor (reduced to 18m) in Italy. Further reductions to the 38m-wide strip have since been implemented to manage environmental, social, cultural heritage and technical constraints.

TAP evaluated the route by collating technical, environmental, social, economic, cultural heritage and technical data on key features such as:

- Social sensitivities associated with landowners, land users, and community concerns.
- Population centres and proposed future development.
- Landscape and topography.
- Nature conservation and protected areas, including designated and candidate areas, protected and sensitive species.
- Cultural heritage.
- Engineering considerations such as roads, overhead cables, rivers, railways and other major pipelines.
- Construction issues such as steep slopes and difficult ground conditions arising from geology, hydrology and geohazards.
- Mineral extraction and areas of existing contaminated land risk.

Refining the pipeline route options

TAP's iterative route selection process supported reduction of the project footprint to minimise social and environmental impacts. It considered constructability issues, the location of compressor stations, the Pipeline Receiving Terminal (PRT) and construction support facilities, and fulfilled all legal and permitting provisions. The following factors were taken into consideration by TAP in refining the base case corridor:

Offshore:

- Identify areas that present engineering or construction challenges to allow for further investigation of safety and integrity factors.
- Avoid protected seagrass areas.
- Minimise interference with navigation channels.
- Minimise pipeline installation and construction constraints, i.e. obstacles, fishing areas, dumping areas, unexploded munitions areas and archaeological sites.
- Minimise the need for engineering and construction challenges to mitigate seabed hazards associated with offshore fishing, dumping, crossings of existing seabed pipelines and communication lines, and geohazards.

Onshore:

- Minimise social and economic impacts and respond to stakeholder concerns.
- Ease of returning areas to pre-existing conditions and land use.
- Air quality and noise disturbance.
- Minimise environmental impacts by avoiding:
 - Protected environmental areas, national parks, etc., where possible.
 - Watercourse crossings in areas affected by urban and/or industrial development plans (i.e. preference for agricultural land).
 - Areas susceptible to landslides, floods and coastal erosion.
 - Marshlands and peat soil.
 - Geohazard areas (prone to phenomena such as landslides and earthquakes).
 - Areas at risk of permanent habitat fragmentation.
- Minimise impacts to cultural heritage.
- Use corridors already constructed by other pre-existing infrastructure (natural gas pipelines, channels and roads) wherever possible.



Different constraints were identified in TAP's host countries and the route selection process adapted to address country-specific ESCH characteristics.

In Greece, the process was driven mainly by the presence of new urban and industrial development areas, infrastructure, and archaeological sites. In Albania, terrain, geohazards (such as landslides and erosion), ecological sensitivities and polluted areas were the main drivers.

In Italy, where landfall location was the main concern, potential impacts were avoided on protected areas and minimised on tourism.

The specific route selection process for the three countries is provided below.

In Albania and Greece, this process is still ongoing. As of August 2017, TAP has gained approval for five re-routes in Greece and four in Albania since the main ESIAs were approved. Minor adjustments continue to be made within a formally agreed governance process.

Greece route selection and refinement

TAP runs for approximately 550km across northern Greece, the pipeline's longest section. Starting at Kipoi, on the border with Turkey, it will end south-west of Leropigi, on the border with Albania.

In eastern Greece, from east of Nea Mesimvria to the Greece-Turkey border, TAP chose to run parallel with the existing high-pressure natural gas pipeline which crosses the provinces of Central Macedonia and Eastern Macedonia-Thrace and is run by the transmission system operator DESFA. By doing this, TAP could seek to minimise the technical and ESCH impacts of project construction. However, some local re-routings were considered necessary to further reduce these impacts.

In western Greece, from west of Nea Mesimvria to the Greece-Albania border, there is no existing pipeline. TAP undertook a thorough investigation of feasible routes based on the approach to selection discussed above.

Five options were identified which, following comparative evaluation, were reduced to two potential routes. Of these two alternatives, the northern route was selected as it had fewer known cultural heritage sites than the southern route. Some further route optimisation was required in western Greece to align with route refinement in eastern Albania.



Purple: north alternative (chosen as new base case) Light blue: original ESIA base case Yellow: alternative parallel to DESFA route Red: south alternative

Responding to stakeholder concerns

Many of the changes in route selection emerged from consultation conducted through extensive ESIA public disclosure procedures and TAP's ongoing stakeholder engagement.

TAP assessed the concerns of stakeholders (either as individuals or through their representatives) and alternative route proposals. These were incorporated into the pipeline route where reasonable and feasible.

Examples of stakeholder-driven changes to the pipeline route in Greece include:

- Amfitriti: the proposed route was changed to take into consideration plans for the construction of a new hospital to the north of the pipeline and ensure a greater safety distance. The planned hospital will now be more than 650m from the pipeline route.
- Foufas Eordea: here the route was changed in response to requests by the Eordea municipality to avoid crossing an area currently under development, allow community plans for small hydropower development in the area, and accommodate material requests for route optimisation.
- Pyrgoi: route changes were designed to optimise the crossing of apple plantations in the area and minimise damage to trees, irrigation networks and crop protection netting.
- Drymos: following a request from the Oreokastro municipality, the route was revised to avoid proximity to sports installations and allow more room for future town expansion.
- Nea Karvali: the local community requested moving the pipeline away from an area heavily affected by existing infrastructure projects (a gas pipeline, tank farms and a main road).

In all these cases, TAP investigated further to make sure that ESCH considerations were duly considered when determining the feasibility of local re-routings.

Philippi area

The pipeline's proposed crossing of the highly organic peat area on the Philippi Plain in Kavala is another example of route optimisation based on consultation and TAP's collaborative approach. In addition to concerns over perceived risks to operational safety and pipeline integrity if the original base case route was chosen, stakeholders were worried that local farmers would face significant socio-economic impacts associated with the loss of agricultural productivity.

Responding to these concerns, TAP carefully evaluated three alternative routes. Each was assessed against the original ESIA base case, its technical feasibility examined, any ESCH constraints considered, and potential conflicts with other infrastructure and projects investigated.



This process revealed that two of the alternatives presented major technical problems, requiring complex mitigation measures that would further increase environmental impacts. These alternatives were therefore rejected.

The third alternative, re-routing to the north, maintained all the advantages of the ESIA base case while avoiding crossing the peat area. Additionally, to minimise the impact on cultivated land, this route mainly followed existing roads and channels. As it also addressed local concerns regarding peat levels in the pipeline corridor and provided a technically feasible and environmentally advantageous alternative for this sensitive area, the third alternative was selected as the new base case for the Philippi Plain. However, the new route will cross the peripheral zone of the archaeological area in Philippi. Additional work and investigations will therefore be required to ensure that pipeline construction does not affect known or newly identified cultural heritage. These activities will be carried out in accordance with national legislation and TAP's established policy and procedure.

Albania route selection and refinement

TAP's route through Albania is approximately 215km onshore and 37km offshore in the Albanian section of the Adriatic Sea. The route starts at Trestenik village, at Albania's border with Greece, and arrives at the Adriatic coast 17km north-west of Fier.

Several onshore corridors and landfall locations were considered. Among additional factors examined during route selection were impacts on tourism and the avoidance of licensed quarry mining, geohazards and areas with the potential risk of contaminated land.

Eastern region

Two alternative route options were identified for the pipeline section in Eastern Albania: 6 and 6A. The table below provides a comparative analysis of the two routes. Alternative 6A was longer but had fewer ecological sensitivities and topographic challenges than Alternative 6. It was therefore selected as the base case option.

Analysis of Eastern Albania Route Options

	Route 6	Route 6A		
Environmental Impacts	Route in proximity to a natural reserve.	Lower impact on protected areas, flora and fauna.		
Land Use	Predominantly forest	Agriculture		
Tourism impacts	Impacts on tourism during construction.	Less tourism potential.		
Cultural Heritage	Six cultural heritage sites in proximity to route.	Higher possibility of undiscovered cultural heritage.		
Construction Constraints	Challenging terrain; limited opportunity for route variations.	Flatter topography; more opportunity to create minor route variations and greater flexibility to respond to archaeological chance finds.		



TAP conducted a comprehensive consultation exercise along base case route 6A. This involved meetings with external stakeholders including the general public and relevant authorities, resulting in further optimisation of the route.

Central region

The Hotova region lies at the heart of this section and contains the Hotova Fir - Dangelli National Park, a legally protected area which is part of the pan-European Emerald Network of Areas of Special Conservation Interest. Steep slopes and unstable soils are present.

Throughout 2009, six alternative corridors were identified. Four were rejected for their potential to cause irreversible changes to the landscape and the risk of landslides.

The ESCH aspects of the two remaining routes were then further assessed. While both were technically feasible, the southern alternative would not comply with Albanian and EU legislation due to its impact on the national park. TAP therefore adopted the northern alternative as the base case route in this region. The project conducted further technical studies to identify a route that avoided geohazards, such as areas at risk from landslides and erosion. This was an iterative process resulting in several re-routes in the Potom area and a micro-tunnel solution in Corovode.

Western region and landfall

During late 2010 and 2011, six potential landfall sites and six compressor station locations were identified.

Potential pipeline routes to the landfall and compressor station locations were assessed, based on TAP's approach to route selection. Two (alternatives 6E and 6F) were rejected as they fell within the boundaries of the Karavasta Lagoon protected area. The remaining route options were similar in ESCH terms.

The only significant difference was that the three southern landfall options (alternatives 6A, 6B and 6C) were near the Roskovec–Hoxhara channel which a field survey had noted as being heavily polluted with crude oil. To avoid the channel and potential contamination, the northern landfall route alternative (6D) and its associated compressor station option were selected as the base case.



Italian route selection and refinement

Approaching the coast of Italy on its path across the Adriatic Sea, TAP will pass through Italian territorial waters. To avoid areas of Posidonia oceanica seagrass, the pipeline will then be routed through a specially constructed 1.5km-long micro-tunnel, connecting to the coast underground at a depth of 25m.

The total length of the onshore section in Italy will be approximately 8km. There will be a valve station in the vicinity of the landfall in San Foca, and a Pipeline Receiving Terminal (PRT) in the municipality of Melendugno, 8.2km away from the coast and avoiding Natura 2000 conservation and protection areas. The PRT will be the supervisory and control centre for TAP.



Landfall

Five macro-corridors, A to E, were investigated during the basic engineering phase of the project.

Detailed technical, environmental and socioeconomic assessments of these alternatives were conducted and the landfall site north of San Foca chosen. This represented the optimal solution in terms of technical viability, safety and environmental, social, land-use and cultural heritage impacts for the following reasons:

- It did not affect offshore and onshore protected areas.
- The onshore route lies within agricultural and not urbanised areas.

However, during consultations with regulatory authorities, two main issues arose regarding the chosen site:

- The landfall was located within a zone identified as very high risk due to the potential instability of the sea cliffs.
- The proposed PRT location was found to fall within a landscape protection area.

Consequently, TAP reconsidered the entire route selection process and conducted additional studies to:

- Identify the optimal pipeline route and landfall location.
- Minimise residual ESCH impacts.
- Engage further with national, regional and local authorities.

The next step was to identify, evaluate and compare 12 alternative micro-corridors within the macro-corridors and select a preferred option. The map and table below provide a summary of the micro-corridor evaluation.

The preferred micro-corridor (alternative D1) had the specific advantage of not crossing any Natura 2000 sites (a network of nature protection areas in the European Union). Within the D1 micro-corridor, four specific route options were further evaluated based on key cultural, social and environmental constraints.

CHAPTER 09. TAP route selection How was the route chosen?

Key Indicator	Component	Corridor A	Corridor B	Corridor C	Corridor D	Corridor E
Land use	Safety and Social	Unsuitable (presence of continuous urban fabric	Suitable	Suitable	Suitable	Suitable
Protected areas	Environmental	Unsuitable	Suitable (with limitations)	Unsuitable	Suitable	Suitable (with limitations)
Posidonia oceanica	Environmental	Unsuitable	Suitable (with limitations)	Unsuitable	Suitable	Unsuitable
Hydrological hazard	Environmental	Unsuitable	Unsuitable	Suitable (with limitations)	Suitable	Suitable
Planning constraints	Environmental and Cultural heritage	Suitable (with limitations)	Suitable (with limitations)	Suitable (with limitations)	Suitable (with limitations)	Suitable (with limitations)
Summary	All	Unsuitable	Unsuitable	Unsuitable	Suitable	Unsuitable

The preferred landfall route includes an offshore to onshore micro-tunnel that aims to minimise environmental and social impacts. The tunnel avoids:

- Any direct interaction with the Mediterranean maquis and woodland onshore and Posidonia oceanica seagrass offshore.
- Any direct interaction with tourist facilities.



This route is also beyond the legally required distance from existing buildings or groups of buildings.

San Foca was confirmed as the final landfall location by the Ministry of Environment technical commission which assessed and approved the ESIA.

PRT and onshore route

The alternative assessment process aimed to minimise any impacts on the sensitive coastal and territorial areas of Melendugno and Vernole, including areas containing monumental olive trees, archaeological finds and other environmental and social considerations.

The assessment process identified two options for the PRT location and possible routes for each.

The chosen option to the south falls completely within Melendugno municipality. Crossing mainly agricultural land, the route avoids natural and cultural heritage protected areas and maintains the required legal distance from urban areas. This route, and the PRT site at Melendugno, now form TAP's onshore base case route in Italy.

Offshore Route Alternatives

The landfall locations in Italy and Albania largely determined the offshore corridor. However, in parallel with the landfall location selection process, a marine route was selected through the evaluation of constraints that included protected areas; marine habitats of high ecological value; archaeological sites; military, fishing, and anchorage areas; geohazards (for example, subsea landslides); landfall constraints; tourist areas; existing offshore installations such as subsea cables; water depth; and route length.



Great care has been taken to design the PRT to integrate with the surrounding landscape and minimise its visual impact. Following consultations with local stakeholders, the building's architectural design was reviewed and the size of the terminal reduced by 40%.

The marine route selection process used progressively increasing levels of detail and available information to identify and evaluate additional constraints. These included the large amount of unexploded military munitions (UXO) on the seabed, dating from World War II, and the instability of the Albanian slope between the continental shelf and the sea floor.

The routes were also evaluated for appropriate design and necessary construction methods. TAP identified several potentially feasible marine routes that would link the various Albanian and Italian landfall options. Following extensive offshore survey work, the preferred route was determined based on landfall site location and technical, environmental and landscape considerations.

Discover more about TAP's route:

https://www.tap-ag.com/the-pipeline/route-map

10 Land easement & acquisition How has TAP secured access to land on which the pipeline is being built?

TAP needs to secure land access along its approved route for construction and operation of the pipeline and its associated infrastructure. The land easement and acquisition (LEA) process is conducted in accordance with national laws, regulations and the applicable lender standards.

Key objectives of international standards relevant to TAP's land access activities include:

- To avoid or at least minimise involuntary resettlement/economic displacement wherever feasible by exploring alternative project designs.
- To avoid or, where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by
 (i) providing compensation for loss of assets at replacement cost and
 (ii) ensuring that economic displacement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected.
- Improve or, at a minimum, restore to pre-project levels the livelihoods and standards of living of displaced persons.
- Ensure that vulnerable landowners and users are identified, are not disadvantaged by the project, are fully informed and aware of their rights, and are able to benefit equally from project opportunities and benefits.

TAP has acquired permanent land rights for approximately 90 hectares for above ground installations, namely the compressor stations, block valve stations and pipeline receiving terminal.

The project will affect approximately 45,000 landowners and land users. TAP will ensure that they are all treated with respect, assisted through the legal process, and compensated fairly.

Much of the LEA programme has now been completed. Overall, it involves an estimated 20,900 plots of land: 10,200 in Greece, 10,500 in Albania and about 200 in Italy. These numbers are correct at the time of writing but subject to change as the project progresses. For the latest information, please go to https://www.tap-ag.com/land-access.



TAP's LEA process involves approximately 20,900 land plots



Approximately 10,200 plots in Greece, 10,500 plots in Albania and 200 plots in Italy





TAP's Engineering, Procurement, and Construction (EPC) contractors work closely with several local and international companies experienced in land easement and acquisition, involving them as sub-contractors for field work on TAP's behalf in Greece, Albania and Italy.

For most affected people, the impact of the pipeline's construction will be temporary and minimised wherever possible. A relatively small amount of land will be permanently acquired for compressor and block valve stations.

Affected people will be assisted through the legal process related to land access, and compensation paid before work commences. Temporarily acquired land will be reinstated at the earliest opportunity.

Compensation principles

TAP conducts its LEA programme and associated compensation process in accordance with international standards. The principles to which TAP is committed include:

- Complying with applicable national legislation and lender standards.
- Avoiding or minimising the economic and/or physical displacement of people whenever possible.
- Compensation for land and crops based on full replacement value and paid in advance of construction. Full replacement value means that cash compensation levels are sufficient to replace lost land and other assets at full replacement cost in local markets and includes all related transaction costs.
- Land required on a permanent basis for aboveground installations will be purchased from its current owners. Impacts on land ownership and livelihoods will be compensated.
- Land required on a temporary basis, including the pipeline construction strip and temporary facilities, will be used by TAP for the duration of construction. Such land will be leased from its owners and handed back when construction and reinstatement are completed. Temporary use of land will be compensated through land rental or lease agreements.
- Owners of land that is subject to easement and/or restrictions during operations will be compensated in advance.

- Users of land that is affected by the project will be compensated for lost farm income during the construction period (minimum two years) at full replacement value.
- 'Orphan' land, i.e. land which is severed or bisected by TAP, and the portion of the plot that is not directly impacted (acquired or rented by TAP) but is rendered uneconomic, unviable, and/or inaccessible, either permanently or temporarily, will be compensated.
- TAP will enter into voluntary agreements with affected landowners and land users wherever possible.
- TAP will resort to forced easement or acquisition, according to national law, only where no agreement can be reached with the affected land owner.
- All affected people will have access to TAP's grievance mechanism.
- Vulnerable people will be identified and provided with all necessary assistance in relation to LEA and livelihood restoration activities.
- Land owners will be entitled to receive at least a defined minimum compensation payment.

CHAPTER 10. Land easement and acquisition How has TAP secured access to land on which the pipeline is being built?

To ensure that the livelihoods of those affected by the project are fully restored and, where possible, improved, additional agricultural assistance measures are implemented through TAP's livelihood assistance and transitional support programme (LATS) and a land productivity monitoring programme.

TAP will pay compensation for the total period of disturbance (or for 24 months, whichever is greater) while the land is being used by the project.

After construction, TAP will require land easements in the pipeline corridor with some restrictions in the safety zones. Landowners whose land will be leased or eased will keep their land ownership.



Key steps in the LEA process

TAP has secured full access to land for the base case alignment (i.e. excluding re-routes) in Greece, Albania and Italy. The LEA process comprises five key steps, described below.

Identify those affected by TAP and update information

TAP establishes and updates a detailed and comprehensive record, or cadastre (an official register), of the ownership, boundaries and use of all land parcels affected by the project.

Undertake a census and asset inventory

TAP visits affected landowners and land users to conduct an inventory and inspection of their land parcels, including any standing structures and crops. A TAP surveyor asks questions about the owner and their land parcel, and the crops, trees and other assets on it. A written and photographic record is made for use in calculating the compensation offer.

Complete socio-economic study

TAP gathers additional socio-economic data from a sample of affected landowners and users. The socio-economic survey establishes a baseline for monitoring livelihood restoration and for assessing the need for additional livelihood assistance. This information informs the development of the livelihood assistance and transitional support programmes being implemented in each country.

Calculate compensation and process payments

TAP calculates compensation amounts in compliance with the EBRD 'full replacement cost' standard and presents these to the affected landowners and land users. Land access agreements are formalised in a compensation contract between TAP and project-affected persons (PAPs). Once contracts are signed and notarised, compensation payments are processed.

Execute land entry and exit protocols

TAP establishes procedures to ensure landowners and users are fully informed prior to construction on their land so they can make any necessary preparations (e.g. harvest existing crops). Once construction has been completed, owners can sign-off on the satisfactory reinstatement of their land as part of the land exit process. TAP will monitor the productivity of project-affected land for two years following hand-back.

Main types of land access

Land purchase (acquisition)

Where permanent land access is required, TAP buys the land and has full ownership of it. TAP will require permanent land access for aboveground project installations, such as compressor stations, block valve stations and some access roads in Albania. This will require TAP to purchase the land from its current owners.

Temporary land lease

For most landowners and users impacted by the right of way, TAP leases the land for the duration of the pipeline construction period.

In Greece and Albania, TAP mostly requires temporary access to land within the pipeline right of way which will be an estimated 38m wide. In Italy, the right of way will be approximately 26m wide, reduced to 18m where possible, owing to the narrower diameter of the Italian pipeline.

Long-term land easement and restrictions

The area within the right of way where longterm restrictions will apply will not be purchased by TAP but will be subject to a long-term easement, to be registered by TAP on the associated land ownership titles. Restrictions associated with the easement will be compensated accordingly.

Restricted activities within the 8m-wide pipeline protection strip will include building, deep ploughing or planting of trees with deep roots. In Greece and Albania, no new construction can take place within 20m either side of the pipeline.

In Italy, the safety distance from the pipeline to buildings will be kept at 20m for single buildings and 100m for clusters of buildings.

Agricultural activities can be continued within the 40m corridor (including, with some restrictions, in the 8m pipeline protection strip) if they do not interfere with the pipeline's integrity. TAP will clearly describe the restrictions on land use in its agreements with landowners following reinstatement and the return of temporarily acquired lands.

Land and Livelihood restoration

In addition to ensuring that land is reinstated to its pre-construction condition, TAP offers all interested and affected landowners and users a consultation with an agricultural expert to explore how productivity on their land could be enhanced.

TAP provides replacement tree seedlings to allow affected perennial crop and fruit tree growers to replant crops and trees in areas of their choosing. TAP also offers financial management training workshops in key project-affected areas.

To ensure that the livelihoods of those affected by the project are fully restored and, where possible, improved, additional agricultural assistance measures are implemented and monitored through TAP's LATS programme and a land productivity monitoring programme.

Discover more about TAP's land easement and acquisition process and procedures:

https://www.tap-ag.com/land-access and https://www.tap-ag.com/resource-library/ reference-documents/land-access where the Livelihood Restoration Plans (LRP) for each country are posted.



1 Construction and operation

How will the pipeline be built and run?

Construction

TAP began preparatory work on the pipeline in June 2015 with the building and rehabilitation of roads and bridges to access future construction sites in Albania.

For most of its length, the pipeline will not be visible, buried at least one metre beneath the ground.

Above-ground facilities, such as the Pipeline Receiving Terminal (PRT), compressor stations and block valve stations (BVS), will be designed and constructed to have minimal environmental and visual impact.

Onshore pipeline

The onshore sections of the pipeline will be a total length of 773 kilometres (Greece 550km, Albania 215km, Italy 8km).

Greece / Recent Progress 441 km cleared 404 km strung 371 km welded 276 km backfilled 180 km reinstated First hydro-test conducted end-April 2017 90% line pipes delivered Figures as of 1st October 2017

Albania/Recent Progress 147 km cleared 141 km strung 135 km welded 113 km backfilled 87 km reinstated 100% line pipe delivered Phase I access roads & bridges completed at the end of 2016

Figures as of 1st October 2017



Construction of the pipeline and related facilities takes place in phases. The timing of construction is influenced by weather conditions and, in some cases, seasonal restrictions related to ecological sensitivities, agricultural production or tourism.

Construction along the pipeline right of way (RoW) will typically take place over a period of three to six months for each section. The project will require access to land for a longer period, from 12 to 24 months, to allow continuing access for transport and other peripheral construction activities. However, TAP is committed to minimising the required land access period and returning reinstated land to owners at the earliest opportunity.





In Greece and Italy, the workforce are accommodated in nearby hotels. In Albania, two residential camps accommodate the entire workforce. Construction will also require two main marshalling yards and nine pipe yards in Greece, one marshalling yard and six pipe yards in Albania, and two marshalling yards in Italy.

Method

Construction is sub-divided into manageable sections or 'spreads'. Immediately before beginning work on each spread, TAP's Engineering, Procurement, and Construction (EPC) contractors conduct a pre-construction survey to ensure that the latest information on environmental, social and cultural heritage (ESCH) conditions is available and the centreline is marked out correctly.

The pre-construction surveys verify the detailed local information collected through stakeholder engagement in, for example, the environmental and social impact assessment (ESIA) process, negotiating land access, planning the pipeline and transport routes, and conducting community notification and safety briefings. The pre-construction survey crews are accompanied by environmental, social and archaeological specialists to identify and document sensitive ESCH sites.

Following the pre-construction survey, the EPC contractors clear and level the construction strip. Topsoil is stored on the side of the construction strip, separately from subsoil, to prevent mixing and to preserve seed stock for restoration.

The pipeline is constructed from 12m to 18m-long sections of steel pipe which are transported by truck from pipe storage yards to the construction spread and laid end-to-end alongside the trench. Pipes used on land are primarily 120cm (48in) in diameter.

The EPC contractors excavate the pipeline trench to a depth of about 2.5m, allowing the pipeline to be buried with a minimum covering depth of one metre. Deeper burial, or special techniques such as horizontal directional drilling, may be required at some river, road, rail and other crossings.

Individual sections of pipe are welded together into 'strings' to form the pipeline. Protective coating is applied and tested to ensure adequate corrosion protection. The welded pipeline is lowered into the trench which is then back-filled and reinstated.

The integrity of the pipeline is tested by a technique known as hydro-testing. This involves filling sections up to 20km long with water at 125% of its operating pressure to identify and repair any leaks.

Landfalls

TAP's landfall in Albania is located northwest of Fier and will be constructed using a cofferdam. This is a type of temporary sheet piling construction designed to facilitate construction projects in areas that are normally submerged.

To prevent direct interference with Mediterranean maquis woodland, onshore tourist facilities and the nearshore marine environment, the landfall in Italy will be constructed using micro-tunnelling technology. The 1.5km-long micro-tunnel allows the installation of the pipeline without the need to excavate an open trench. It will not be visible from the coast.



Offshore

TAP will cross the Adriatic Sea by the shortest route, between Fier in Albania and Italy's southern Puglia region, a distance of 105km.

The deepest point of the pipeline below sea level will be 820m in the Strait of Otranto.

The offshore pipeline installation will be a sequential pipe construction and installation process undertaken from a pipe-laying vessel or barge.

Using the 'S-lay' method, referring to the shape of the pipeline on its way to the seabed, pipes 12m long will be welded to the pipeline string on the deck and carefully lowered into the sea.



The steel pipe for the offshore section has a diameter of 90cm (36in) and a thickness of 20 to 34mm (0.79 to 1.34in), depending on the depth of water. At depths of less than 300m, the pipe will be coated with concrete for protection against potential damage.

Reinstatement post-construction

TAP is committed to returning the RoW to its pre-project contours, use and productivity. This will include erosion and sediment control measures and re-vegetation.

Reinstatement begins once construction activities are completed. But preparations take place before construction starts to ensure that the design of any special erosion control measures is appropriate and that topsoil, subsoil and other materials are excavated, stored and maintained ready for reinstatement. Soil erosion and reinstatement is also subject to monitoring by TAP during construction and prior to returning land to its owners.

TAP's Soil Erosion and Reinstatement Plan (SERP) establishes what is required for the reinstatement of areas disturbed by construction works that are not needed permanently by the project. The plan addresses topographical reinstatement (returning the land to its original topographical profile, or contours, wherever possible), erosion control and stabilisation of the terrain throughout the construction period and into the pipeline's operational phase.

The project's EPC contractors are responsible for maintaining the integrity of the RoW, all temporary and permanent soil erosion measures and reinstatement. On handover at the end of the construction contract, the TAP operations team will assume responsibility for maintenance of the RoW. The plan also covers all other land areas that are used to support construction, such as camps, pipe lay-down areas, maintenance areas, roads and other transport facilities, and waste management and disposal sites. It includes temporary and permanent erosion control, installation requirements and methods for disposing of any materials that are surplus to reinstatement needs.

TAP will return disturbed portions of river beds and banks that the pipeline crosses to preconstruction conditions. EPC contractors are obliged to recover and restore riverbed material, install and maintain erosion and sediment control devices until revegetation is established, and design and install bed stabilisation works where necessary, all with the project's prior approval and regular monitoring.

Revegetation

TAP is committed to re-establishing vegetation along the RoW to its original condition, composition and density as closely and auickly as possible. The only exception is along the 8m-wide pipeline protection strip in Greece and Albania, which needs to be kept clear of trees for safety and operational purposes. TAP will replace any trees within this strip with more suitable plant species. In Italy, the existing olive trees will be replanted in close proximity to the pipeline.

Native or naturalised species of plants favourably adapted to the local environment will be used, avoiding invasive or intrusive species. Native species sourced locally will be given priority if they are commercially available.

Bio-restoration will be achieved by:

- Natural revegetation and regeneration based on the seed bank preserved within the topsoil stockpile, once this layer is distributed over the affected areas.
- Assisted revegetation in defined areas using a combination of naturalised species from commercial sources and native species collected carefully from the pipeline route and surrounding area.

The assisted revegetation will aim to be representative of the natural and existing biodiversity of the area before construction.

Reforestation

TAP will reforest any areas where a forest existed on the RoW prior to construction of the pipeline. TAP is committed to successfully replacing every tree felled during clearance and exceeding this target where local conditions require.

However, not all trees will be replaced in the same location from which they were removed as planting cannot take place along the 8m pipeline protection strip. TAP's biodiversity framework includes an offset strategy designed to address any residual impacts on biodiversity, focusing on priority species, biodiversity features and habitats.

Farm land

For arable areas, TAP will return the land to the owner or user in a fit state for them to re-plant with their own seed crops, subject to restrictions on planting trees in the 8m pipeline protection strip.

In these and other developed areas, TAP will leave the land in the condition specified in the pre-entry agreements made under its Land Easement and Acquisition (LEA) programme (see Chapter 10 for details).



Land restoration will be supported by soil testing to confirm that soil quality is maintained. Landowners will verify in the exit protocol that the terms of the pre-entry agreement are fulfilled. To ensure that the livelihoods of those affected by the project are fully restored and where possible, improved additional agricultural assistance measures are implemented through TAP's livelihood assistance and transitional support programme (LATS) and a land productivity monitoring programme.

Where livestock or wild animals may be present, TAP will ensure precautions are taken to protect them from any harm. This may include:

- Pre-construction assessments of existing conditions (e.g. noise, dust and vibration) and, if necessary, support from veterinary specialists.
- Implementation of additional mitigation to further minimise impacts relating to construction disturbance.
- Liaison and agreements with livestock managers.
- Erection of stock-proof fencing along project area boundaries where this would not obstruct the movement of livestock or wild species.
- Monitoring during construction of dust, noise, and animal well-being and welfare.

Monitoring

On completion of reinstatement, TAP inspects disturbed areas to ensure that restoration measures are effective, e.g. slope stability, surface shape, surface water drainage, compaction, revegetation and ecological quality indicated.

Operation and maintenance

The pipeline is designed to require minimal operational and maintenance intervention.

TAP's operation will ensure continuous, reliable and safe gas delivery in line with current best practice in the pipeline industry.

Planned maintenance and inspection programmes will apply a combination of modern management practices, condition assessment methods, information technology and innovative engineering technical analyses to manage any risks associated with long-term plant and equipment operations.

Decommissioning

At the end of its nominal lifetime (at least 50 years), the pipeline and associated facilities such as block valve and compressor stations will be decommissioned. A detailed environmental and social impact assessment (ESIA) or its contemporary equivalent will be undertaken in advance to help determine the best approach.

At this stage, the current plan is that all buildings would be taken down and the sites reinstated. The pipeline, both onshore and offshore, would be left in situ to minimise any environmental, social or cultural heritage impacts associated with removal.

While it cannot be known currently which decommissioning approaches will be taken in future, TAP is committed to full compliance with any prevailing legislative and industry requirements.

TAP will monitor progress on a regular basis against a set of pre-agreed targets. Such targets will include tangible evidence that TAP's environmental and social commitments and mitigation measures are being met. If necessary, further reinstatement work will be undertaken.

Discover more about TAP's construction and operation:

https://www.tap-ag.com/resource-library/media-library/ videos and https://www.tap-ag.com/the-pipeline/ building-the-pipeline

/Glossary

Term/acronym/abbreviation/measurement

	Definition		
ALARP	as low as reasonably practicable		
BAP	Biodiversity Action Plan		
BAT	best available technology		
bcma	billion cubic metres of gas per year		
BMP	Biodiversity Management Plan		
BOS	Biodiversity Offset Strategy		
BVS	Block valve station		
cadastre	Register of property showing the extent, value, and		
CCP	Contractor Control Plan		
	Cultural Heritage Advisor		
СНМР	Cultural Heritage Management Plan		
CIA	Cumulative Impact Assessment		
CLC	Community Liaison Coordinator		
cm	centimetre		
CO ₂	Carbon Dioxide		
CS	Compressor station		
CSO	Cadastral Survey Office		
CSR	Corporate Social Responsibility		
DESFA	Natural gas transmission system operator in Greece		
E&S	Environmental and social		
EBRD	European Bank for Reconstruction and Development		
EIB	European Investment Bank		
Emorald Nobyork	Pan-European network of Areas of Special		
EITIEIdid Nelwork	Conservation Interest.		
EMP	Ecological Management Plan		
	A change to the environment (i.e. any aspect of the		
	natural or semi-natural physical environment - air,		
Environmental impact	water, soil etc.) which may occur because of project		
	activities. Impacts may be considered to be positive		
	or negative.		
EPC	Engineering, Procurement and Construction		
	Risk management tramework adopted by certain		
Equator Principles	tinancial institutions for determining, assessing and		
	managing environmental and social risk in project		
- EDD	IInance.		
	Energency Response Fran Environmental Social and Cultural Heritago		
	Environmental Social and Cultural Haritage		
	Environmeniai sociai ana Cuiturai Heniage Management System		
ECIA	Environmental and social impact assossment		
	Environmental and Social Implementation Plan		
	Environmental and Social Management Plan		
ESIVIE			
Espoo	Convention on Environmental Impact Assessment in a		
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	Transboundary Context (1991)		
EU	European Union		
FEED	Front end engineering design		
GA	Government Affairs		
GGMP	Greenhouse Gas Management Plan		
GHAT	Geohazard Assurance Team		
GHG	Greenhouse Gases		
GLAC	Guide to Land Acquisition and Compensation		
GMF	Grievance Management Framework		
HGA	Host Government Agreement		
HS	Health & Safety		
hydrology	Branch of science concerned with the properties of the earth's		
ily along y	water, and especially its movement in relation to land.		
IFC	International Finance Corporation		
IGA	Intergovernmental Agreement		
ILO	International Labour Organization		
in	inch		
IOBE	Foundation for Economic and Industrial Research (Greece)		
IPMT	Integrated Project Management Team		
IPRO	Immovable Property Registration Office (Albania)		
ISO	International Organization for Standardization		
IVMS	In-Vehicle Monitoring Systems		
karst	Landscape formed by dissolution of soluble rocks, including		
	limestone and dolomite, by underground water.		
km	kilometre(s)		
LATS	Livelihood Assistance and Transitional Support		
LEA	Land Easement and Acquisition		
LM	Land Management		
LRP	Livelihood Restoration Programme		
_ m	metre(s)		
	Dense scrub vegetation consisting of hardy evergreen shrubs		
maquis	and small trees, characteristic of Mediterranean coastal		
	regions.		
MMMP	Marine Mammal Mitigation Protocol		
NGO	Non-governmental organisation		
OECD	Organisation for Economic Co-operation and Development		
OHSAS	Occupational Health and Safety Assessment Series of Standards		
PAP	Project-attected person		
pigging	Use of devices ('pigs') to perform various maintenance		
	operations in a pipeline such as cleaning and inspection.		
PIMS	Project Information Management System		
Posidonia oceanica	A species of seagrass native to the Mediterranean.		
	Pipeline Receiving Ierminal		
	KOUIE ENVIRONMENTAI IMPACT KEGISTER		
<u>KFA</u>	Rapia Field Assessment		
KOW	KIGNT OT WOY		
	KOUTE SOCIAI IMPACT PIAN		
KSIK	KOUTE SOCIAI IMPACT KEGISTER		
	South Caucasus Pipeline expansion		
	Snan Deniz 2 natural gas tiela, Azerbaijan		
3EA	supplementary ecological Assessment		

SEI	Social and Environmental Investment
SERP	Soil Erosion and Reinstatement Plan
SES	Stakeholder Engagement Strategy
SFM	Social Field Monitor
SGC	Southern Gas Corridor
SGMT	Stakeholder and Grievance Management Tool
Snam	Snam Rete Gas – natural gas transmission system operator in Italy
SOCAR	State Oil Company of Azerbaijan Republic
SRP	Site Reinstatement Plan
Stakeholder	Any person, group or organisation that may be affected by the project, and may in turn affect project design, development or operation.
TANAP	Trans Anatolian Pipeline
ТАР	Trans Adriatic Pipeline
TMP	Traffic Management Plan
UXO	unexploded ordnance (munitions)
Vulnerable persons	People or groups who may be functionally limited in their ability to participate in consultation and decision-making about the project; in their physical capacity to adapt to new circumstances; in their ability to restore their livelihoods; or to benefit from project opportunities. Vulnerability is characterised by higher risk and reduced ability to cope with shock or negative impacts. It may be based on socio- economic condition, gender, age, disability, ethnicity, or other criteria that influence people's ability to access resources and development opportunities.

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