

The PERU LNG Project's Contribution to World Heritage

**By Gregory D. Lockard
Environmental Resources Management (ERM)**

The PERU LNG Project involved the construction of a natural gas pipeline (Slide 2), liquefaction plant (Slide 3), and marine terminal to load liquid natural gas (LNG) ships (Slide 4). The project also involved the use of a quarry to obtain rocks for the construction of a breakwater at the marine terminal (Slide 5). The PERU LNG plant is the first natural gas liquefaction plant in South America. The pipeline extends from the community of Chiquintirca in Ayacucho to the plant and marine terminal at Melchorita (Slide 6), which is located on the Pacific coast approximately 170 kilometers south of Lima. The pipeline extends for 408 km and passes through the departments of Ayacucho, Huancavelica, Ica, and Lima. It ranges in elevation from approximately 150 meters above sea level at the plant to over 4900 meters, making it the highest natural gas pipeline in the world.

The PERU LNG Project has produced significant economic benefits for the people and government of Peru, and will continue to do so for years to come. It is the largest private investment project to date in Peru at over \$3.8 billion. The operation of the plant will result in the inflow of foreign currency into the economy, as the country's export revenues will reach an estimated average of \$1 billion per year. The Peruvian government will receive approximately \$310 million a year in taxes and indirect royalties during its operation. A percentage of the royalties will be distributed to the project's regions of influence by means of the Camisea Socio-economic Development Fund (Fondo Desarrollo Socioeconómico de Camisea, or FOCAM).

The archaeology program of the PERU LNG Project has also made significant contributions to world heritage. In the remainder of this paper, I will discuss some of the contributions that the PERU LNG Archaeological Project has made in regards to methods, public participation, dissemination of results, and our understanding of past human societies. First, however, I will present a brief introduction to compliance-based archaeology in Peru.

Compliance-Based Archaeology in Peru

All archaeological sites and objects in Peru are protected by Peruvian law. The Ministry of Culture (Ministerio de Cultura, or MINCU, formerly the INC) is the governmental agency in charge of managing Peru's cultural patrimony, including archaeological sites. The INC has strict regulations regarding what must be done in order to excavate an archaeological site. According to the Peruvian General Law of the Nation's Cultural Patrimony (Ley General del Patrimonio Cultural de la Nación – Ley No. 28296), all archaeological materials are the property of the State, regardless of where they are found and how they are recovered. Peruvian law stipulates that archaeological investigations must take place before the initiation of any construction activity by private companies and governmental agencies. All archaeological materials recovered during these investigations are then handed over to the State. The Peruvian Regulation of Archaeological Investigations (Reglamento de Investigaciones Arqueológicas – Resolución Suprema No. 004-2000-ED) and later modifications provide for four types of archaeological projects by private companies (Slide 7): 1) Survey Projects without Excavations; 2) Evaluation Projects with Excavations; 3) Archaeological Rescue Projects; and 4) Emergency Projects.

Under normal circumstances, the archaeological investigation of a future construction area begins with a Phase I survey (Slide 8), which is designed to identify potential archaeological

sites within the Project Area. After the archaeological survey is completed, a Phase II evaluation must be performed for all potential archaeological sites identified during the survey (Slide 9). The purpose of the archaeological evaluation is to determine whether or not the sites are in fact archaeological and to determine the sites' boundaries. Unlike in the United States and many other countries, all archaeological sites are considered to be significant, regardless of their size, nature, and integrity. Historic archaeological sites, however, are generally not protected, although Peruvian laws and regulations do not explicitly exclude them from such protection. After the archaeological evaluation is completed, a Phase III rescue (i.e., data recovery) must be performed for all of the sites confirmed to be archaeological during the evaluation (Slide 10). The purpose of the archaeological rescue is to excavate all archaeological remains and recover all artifacts located within the Project Area. Unlike in many other countries, Phase III projects do not employ sampling strategies, but are instead full data recoveries. After each phase is completed under the supervision of an INC archaeologist, a final report must be submitted and approved by the INC before the next phase can commence. After the Phase III rescue report is approved, the INC issues a Certificate of the Inexistence of Archaeological Remains (Certificado de Inexistencia de Restos Arqueológicos, or CIRA) for the Project Area. This CIRA serves as a permit to begin construction activities in the Project Area. If new areas are required for construction, the entire process must be followed and a new CIRA issued for these areas.

Peruvian law protects any and all archaeological resources discovered within an area even after a CIRA has been issued, including sites that were missed and subsurface remains that were not visible during the survey. As a result, governmental agencies and private companies are required to obtain INC approval for and implement archaeological monitoring plans (Slide 11). Under these plans, professional archaeologists monitor all construction activities. Archaeological remains discovered during construction, which are known as chance finds (hallazgos fortuitos), must be fully excavated under the monitoring plan (in the case of small sites or sites with no integrity) or as part of new Phase II and III projects.

The PERU LNG Archaeological Project

The principal goal of the PERU LNG Archaeological Project was to obtain CIRAs for the construction of the plant, quarry, and pipeline. In summary, 137 archaeological sites were rescued within the Project Area as part of INC-approved projects (Slide 12). An additional 140 sites were investigated as chance finds under archaeological monitoring plans (Slide 13). A total of 277 sites were therefore investigated as part of the project. These sites represent every archaeological resource, regardless of its size, nature, or integrity, that was identified in the Project Area during the archaeological survey and monitoring of construction activities. PERU LNG followed Peruvian law and INC regulations in the investigation of all of these sites. In addition, the company was committed to meeting or exceeding the highest professional standards for archaeological research in the investigation and treatment of these sites. PERU LNG obtained 231 CIRAs covering the entire Project Area. Despite very stringent laws and regulations, the project was not cited with a single violation by the Peruvian government. Unfortunately, this is still the exception rather than the rule for large private investment projects in Peru.

Artifact and Data Analysis

PERU LNG went above and beyond legal requirements and conducted extensive analyses of the artifacts recovered from the vast majority of the sites excavated during the project. Peruvian law

and INC regulations require that all artifacts recovered during evaluation and rescue projects are cleaned, sorted, weighed, catalogued, labeled, bagged, boxed, and submitted to the INC for long-term curation (Slide 14). The analysis of artifacts is not required, but is an essential part of any archaeological investigation. Excavations by themselves only reveal the geological context and the nature of any architecture that may be present at a site. In order to answer questions such as who lived and/or worked at a site, how they made a living, and how the site functioned, it is necessary to also analyze the artifacts recovered from excavations. Ceramic vessels and diagnostic sherds (i.e., fragments) (Slide 15), diagnostic lithics (i.e., stone tools and the byproducts of their manufacture) (Slide 16), human bones, animal bones (Slide 17), shell, textiles, and metal objects recovered during the project were all analyzed under the direction of Peruvian specialists. A large sample of artifacts was photographed by archaeologists, and a smaller sample of museum-quality artifacts were drawn by an artist (Slide 18) and photographed by a professional photographer.

Public Participation

The direct area of influence of the PERU LNG Project is comprised of populations located both on the coast and in the Andean sierra, and was defined by Environmental and Social Impact Assessments (ESIAs) (Slide 19). These studies determined that the direct area of influence of the plant consists of one district in the Province of Cañete (Department of Lima) and five districts in the Province of Chincha (Department of Ica). With regard to the pipeline, its direct area of influence includes 34 communities in the regions of Ayacucho and Huancavelica, in addition to land owners in one district in the Province of Cañete, five districts in the Province of Chincha, and three districts in the Province of Pisco (Department of Ica).

The PERU LNG Archaeological Project involved the participation of more than 200 professional Peruvian archaeologists (Slide 20) and approximately 2,000 local community members (Slide 21). The community members performed excavations, assisted in site registration, and washed artifacts under the direction of the professional archaeologists (Slide 22). As part of PERU LNG's social commitments, each archaeological site was excavated by members of the community in which the site was located. As a result, local community members played a role in how these sites were investigated and were also able to learn about the prehistory of their community.

Dissemination of Results

Peruvian regulations require that the results of compliance-based archaeological projects be published. Unfortunately, however, this requirement is rarely followed and is not currently enforced by the government. The results of the PERU LNG Archaeological Project, however, were presented to the public by means of a bilingual book (Lockard 2010) (Slide 23). This book explains, in accessible language, the results of the project, as well as basic information such as what archaeology is (Slide 24), why it is important to study and protect archaeological sites, and what laws and regulations exist in Peru to protect archaeological sites and regulate their investigation. The book contains professional photos of all of the museum quality artifacts recovered during the project (Slide 25), as well as numerous photos of fieldwork and lab work being conducted by professional archaeologists and local community members. The book was distributed to communities affected by the project, as well as to public and private universities throughout the country. PERU LNG also coordinated a month-long exhibit of artifacts recovered during the project in Peru's National Museum (Museo de la Nación) (Slide 26), which also

serves as the headquarters for the INC. In addition, PERU LNG is in the process of editing a second book on the results of the project, which is designed for professional archaeologists.

Results of the PERU LNG Archaeological Project

Of the 277 sites investigated during the PERU LNG Archaeological Project, all but seven are located within a 50 meter wide linear transect that extends from the western slopes of the Andes to the Pacific coast. A settlement pattern analysis of these 270 sites revealed that many of the rescue sites have multiple functional components (Slides 27-28). Due to the small size of the chance finds, no site contained more than one function. As a result, the functions of the chance finds are in fact site types rather than functional components. Nevertheless, most of these site types correspond with functional components of the rescue sites.

On the coast, the PERU LNG pipeline is largely confined to the desert rather than river valleys in order to avoid modern settlements and agricultural land. As a result, no archaeological sites with residential components were discovered. The most common functional component/site type is artifact scatters, followed by isolated burials, small rock monuments known as huancas, and lithic scatters. A single ash deposit and a road segment were also investigated. The archaeological sites investigated in the highlands were considerably more varied in regards to function. The most common functional component/site type is residences, followed by terraces (most of them agricultural), corrals (most of them for llamas and/or alpacas), road segments, artifact scatters, huancas, burials, isolated walls, windbreaks, civic/ceremonial contexts, rockshelters, and lithic scatters. A single ash deposit, lithic quarry, and roadhouse (i.e., tambo) were also investigated, and the remaining two sites are of unknown function. Highland sites ranged from scatters of a few localized ceramic sherds to large complexes with multiple functions.

Of the 270 archaeological sites in the settlement pattern analysis, no ceramics were recovered from 107 sites, and no temporally diagnostic ceramics were recovered from another 72 sites. Of the remaining 91 sites, PERU LNG was able to fully analyze the diagnostic ceramics from 70 (Slide 29). This analysis revealed that the archaeological sites investigated by PERU LNG date from the Initial Period (c. 1800-1000 B.C.) to the Colonial Period (A.D. 1532-1821). Prehistoric coastal sites pertain to the Paracas culture, the Nazca and associated cultures of the Early Intermediate Period, the Wari Empire, the Chinchu culture, and the Inka Empire. Most of the prehistoric highland sites pertain to the Rancho and Warpa cultures, the Wari Empire, and the Chanka confederation.

Summary of the Results of the Settlement Pattern Analysis Slides 30-31

The Principal Rescue Sites

Four archaeological complexes composed of two or more individual sites stood out in terms of their architecture and/or artifact density (Slide 32). The Corpas Complex is located on a steep hillside overlooking the Torobamba River in the Ayacucho highlands (Slide 33). Most of the temporally diagnostic ceramics recovered from the complex pertain to the Warpa culture, although earlier Rancho and later Wari ceramics were also recovered. The Corpas Complex includes a small platform and oval-shaped plaza surrounded by well-constructed terraces (Slide 34). PERU LNG rerouted the pipeline in order to avoid this important part of the complex. In the sections of the complex that were excavated, archaeologists uncovered residential

architecture, burials, and a series of agricultural terraces extending up the hillside (Slide 35). The Corpas Complex was most likely an important agricultural, residential, and ceremonial center of the Warpa people (Slides 36-39).

The Pumapuquio Complex is located in a highland valley in Ayacucho. Most of the ceramics recovered from the complex pertain to the Wari Empire, although some earlier Warpa ceramics were also recovered. Archaeologists uncovered the foundations of several clusters of dense architecture at the complex. This architecture was not visible on the surface and was not discovered until rescue excavations were underway. Most of the clusters consisted of residential architecture, as well as multiple burials and offering pits with whole ceramics and other objects (Slide 40). One of the clusters was composed of a few dozen well-constructed rectangular rooms, associated irrigation canals designed to bring water into and/or waste out of the rooms, and a circular or slightly D-shaped ceremonial room (Slides 41-43). These rooms were associated with several features, including hearths, cists, and pits. Three burials and offerings of ceramics and other artifacts were recovered from many of the cists and pits. The architectural details of this section of the Pumapuquio Complex indicate that it was most likely an administrative outpost of the Wari Empire (Slides 44-53).

The Rumajasa Complex is located on a narrow ridge on the western slopes of the Andes in Ica (Slide 54). Ceramics recovered from the complex indicate that it pertains to the Wari and Chanka cultures. The complex is dominated by a large rectangular building with two large rectangular and three small circular rooms. Ninety-eight pits were discovered throughout the building, and six were found just outside of it (Slides 55-56). Many of these pits contained offerings, including llama and/or alpaca bones, the sherds of ceramic vessels designed to hold liquids (perhaps Chicha, or corn beer), spindle whorls for weaving, quartz fragments, lithics, charcoal, and ash. One of the smaller rooms and several of the pits contained human remains that represent secondary burials (Slides 57-58), meaning that they were buried long after the people died (Slide 59).

Finally, the Bernales Complex is located near the Pisco River on the Pacific coast in Ica. Ceramics from the complex pertain to the Chincha and Inka cultures. The complex is probably associated with a small adobe pyramid located nearby but outside of the Project Area (Slide 60). A small ring of rocks and another alignment of rocks that may have been part of a second circular structure constitute the only architecture discovered at the complex. A substantial number of artifacts, however, were recovered from the excavations (Slide 61). These artifacts consist of ceramic sherds, lithics, shells, bone, and a few metal artifacts and poorly preserved textile fragments (Slides 62-65).

Other Sites

Kiccaorcco (Slides 66-68)

Pampa Melchorita (Slides 69-70)

Sitio 2 (Slides 71-74)

Mayopampa 1 (Slide 75)

Chance Finds (Slide 76)

Conclusion

Compliance-based archaeology has come a long way in Peru in the last few decades. A commitment to compliance with cultural heritage laws and INC regulations by private companies has become the rule rather than the exception. As the published book designed for the public,

museum exhibition, and planned academic volume demonstrate, some companies are also beginning to see archaeological investigations as a valuable investment in Peru's cultural heritage, rather than just a means to comply with the law. It is hoped that the success and popularity of PERU LNG's efforts will convince other companies to make similar investments in world heritage.

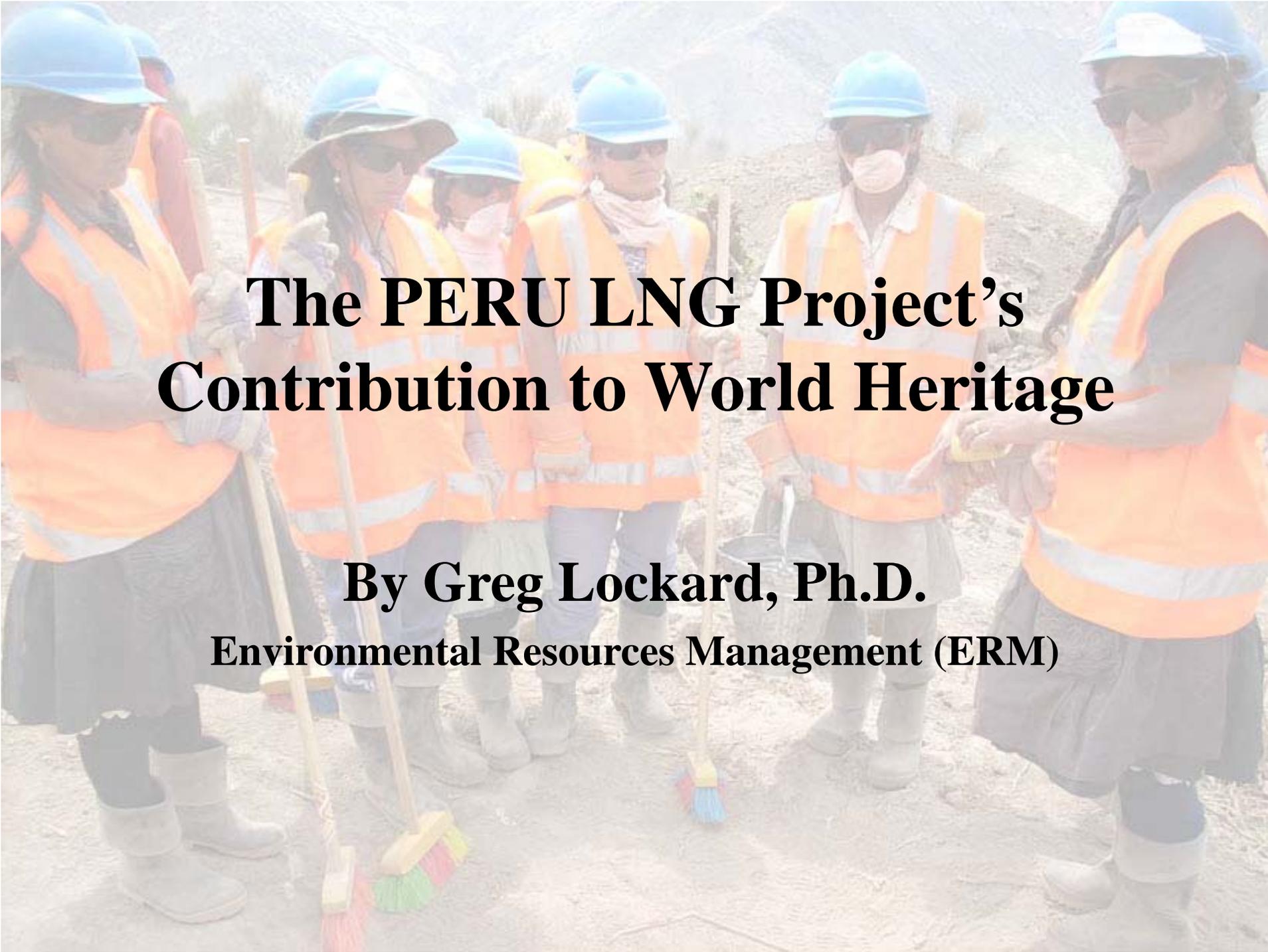
Peruvian law and INC regulations require that the results of compliance-based archaeology projects be presented to the government in the form of technical reports. These reports ensure that valuable information about Peru's past is not lost forever. The reports rarely present more than a basic description of the cultural materials recovered, however, and include very little if any interpretation. Furthermore, access to the reports is limited, and knowledge of their existence rarely extends beyond project participants. As a result, publication of the results of compliance-based archaeological investigations is essential in order for the information to be properly disseminated and thus contribute to our collective knowledge about Peru's past. Although modern societies are constantly constructing new buildings and landscapes and creating new objects, the archaeological sites and artifacts of past societies are a limited resource. In other words, the archaeological sites excavated as part of compliance-based archaeological projects will never be replaced by sites of like kind.

Publication of the results of compliance-based archaeological investigations is important for another reason as well. Although archaeological projects by academics have proliferated in recent years, very few of these archaeologists investigate small, rural sites in Peru. As a result, compliance-based projects result in data from sites that would otherwise never be investigated. These investigations represent the only window that we have into the way of life of the people who lived in small, rural communities in the past, which represents the majority of prehistoric Peruvians. While the investigation of a single small site tells us very little about Peru's past, the combined information from many such sites can tell us a lot about prehistoric rural populations that are otherwise underrepresented by academic archaeological research. If more companies commit to publishing the results of their compliance-based projects, our database of such sites will grow exponentially, which will no doubt make a significant contribution to world heritage (Slide 77).

References Cited

Lockard, Gregory (texts)

2010 *Proyecto Arqueológico/Archaeological Project*. Bilingual book published by PERU LNG. Editing and design by David Vexler and Kick Off & Asociados, Photography by Eduardo Hiroso. Comunica2, Lima.



The PERU LNG Project's Contribution to World Heritage

By Greg Lockard, Ph.D.

Environmental Resources Management (ERM)



The PERU LNG pipeline during construction



The PERU LNG natural gas liquefaction plant at Melchorita



The PERU LNG marine terminal at Melchorita



The PERU LNG quarry (top) and quarry access road (bottom)



Direct area of influence of the PERU LNG Project

Types of Compliance-Based Archaeological Projects in Peru

- 1. Survey projects without excavations.**
- 2. Evaluation projects with excavations.**
- 3. Archaeological rescue projects.**
- 4. Emergency projects.**

Source: Reglamento de Investigaciones Arqueológicas (Resolución Suprema No. 004-2000-ED), implementing regulations of the Ley General del Patrimonio Cultural de la Nación (Ley No. 28296, 23-Jul-2004).



Phase I archaeological survey: Registering a pre-Hispanic road



Phase II archaeological evaluation: Mayopampa 1 (110-01-01)



Phase III archaeological rescue: Ayaorqo (V-27)



Archaeological monitoring: Excavating a chance find.

HALLAZGOS FORTUITOS ENCONTRADOS EN LA CONSTRUCCIÓN DEL GASODUCTO DE PERU LNG



Map of PERU LNG archaeological chance finds



Long-term curation at an INC facility of artifacts recovered during the PERU LNG Archaeological Project



Analysis of ceramic sherds recovered during
the PERU LNG Archaeological Project



Analysis of lithics recovered during the PERU LNG Archaeological Project.



Analysis of animal bones recovered during the
PERU LNG Archaeological Project



Artist drawing whole and near whole ceramic vessels recovered during the PERU LNG Archaeological Project.



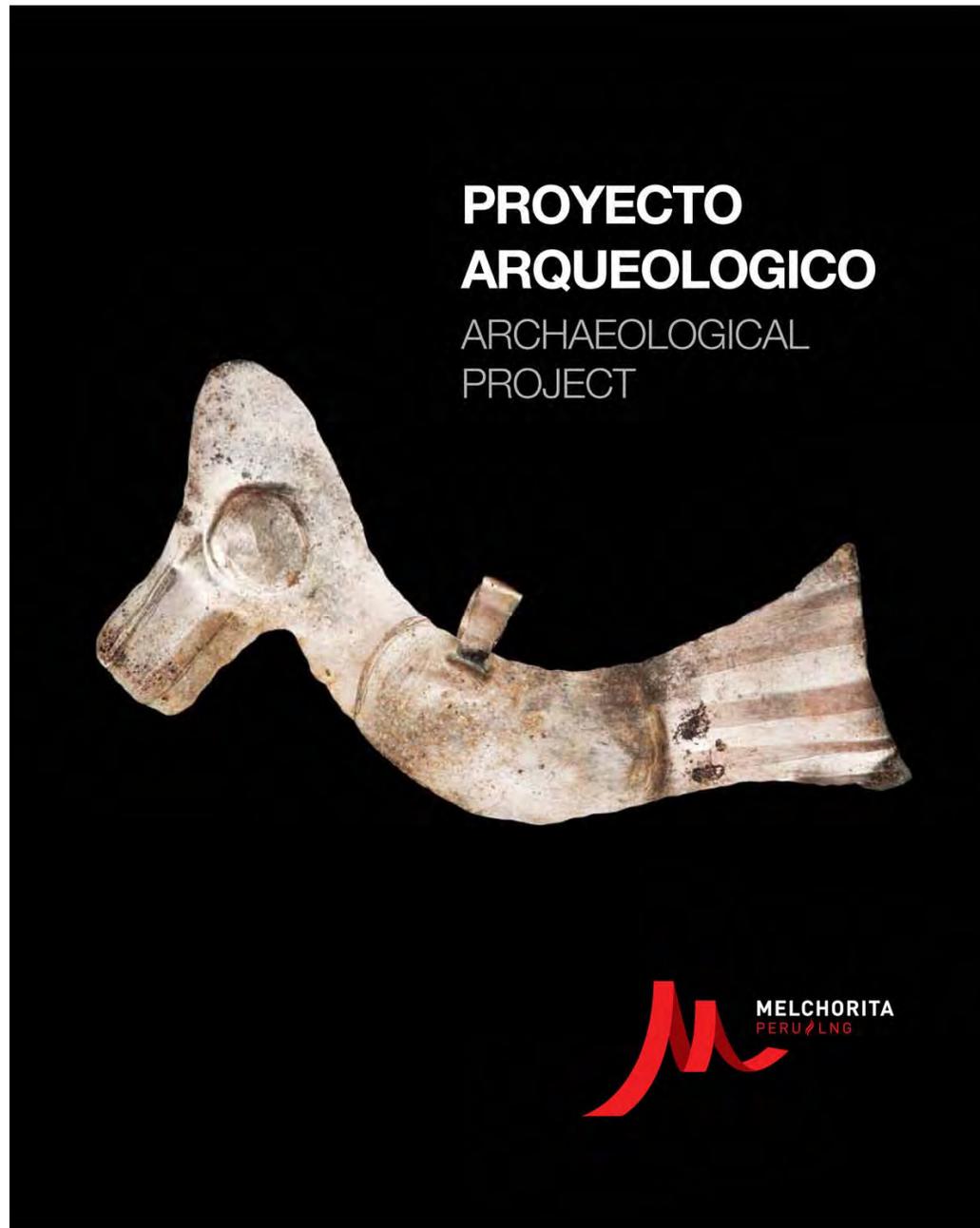
Professional Peruvian archaeologists excavating a feature during the PERU LNG Archaeological Project



Local community members working on the PERU LNG Archaeological Project



Local community members washing artifacts during the PERU LNG Archaeological Project



Public book on the PERU LNG Archaeological Project (cover)

El Proyecto Arqueológico de PERU LNG

El objetivo del Proyecto Arqueológico de PERU LNG fue obtener los CIRA requeridos para construir una planta, una cantera y un gasoducto. Un total de ciento treinta y siete sitios arqueológicos fueron rescatados dentro del área del proyecto. En la implementación de los planes de monitoreo arqueológico se investigaron ciento cuarenta sitios adicionales como hallazgos fortuitos. El Proyecto Arqueológico de PERU LNG, por lo tanto, investigó doscientos setenta y siete sitios arqueológicos. PERU LNG cumplió con la legislación peruana y con los reglamentos del INC en la investigación de todos estos sitios. Además, PERU LNG siguió los estándares profesionales más altos aplicables a los trabajos arqueológicos tanto durante la investigación como en el tratamiento de los sitios.

Equipo que realizó las excavaciones del sitio arqueológico de Pampa Melchorita (P1) en la planta en el 2005.
Crew that excavated the archaeological site of Pampa Melchorita (P1) at the plant in 2005.



The PERU LNG Archaeological Project

The principal objective of the PERU LNG Archaeological Project was to obtain CIRA for the construction of the plant, quarry, and pipeline. In summary, a total of 137 archaeological sites were rescued within the Project Area as part of INC-approved projects. An additional 140 sites were investigated as chance finds under archaeological monitoring plans. A total of 277 sites were therefore investigated as part of the PERU LNG Archaeological Project. PERU LNG followed Peruvian law and INC regulations in the investigation of all of these sites. In addition, PERU LNG was committed to meeting or exceeding the highest professional standards for archaeological research in the investigation and treatment of the sites.

Trabajadores locales excavando un sitio arqueológico bajo la supervisión de arqueólogos de PERU LNG.
Local workers excavating an archaeological site under the supervision of PERU LNG archaeologists.



› Tazas de cerámica Warpa ubicadas en Kiccaorcco.
Warpa ceramic cups from Kiccaorcco.



V60-1230, 18 cm de altura por 12.5 cm de ancho.
V60-1230, 18 cm tall by 12.5 cm wide.

Con decoración.
V60-1233, 11.9 cm de altura por 10.3 cm de ancho.
Decorated, V60-1233, 11.9 cm tall by 10.3 cm wide.



Public book on the PERU LNG Archaeological Project (artifact photos)

Noticias Perú > Sociedad > Inauguran nueva exposición sobre el rescate cultural

Inauguran nueva exposición sobre el rescate cultural

Jue, 21/07/2011 - 23:22

Promedio



El ministro de **Cultura, Juan Ossio**, inauguró la exposición realizada conjuntamente con **PERU LNG, "Estado y empresa: Aliados por el rescate cultural"**, en la que se exponen por primera vez los **hallazgos del proyecto de rescate y monitoreo arqueológico** llevado a cabo por la mencionada empresa

entre 2005 y 2009.

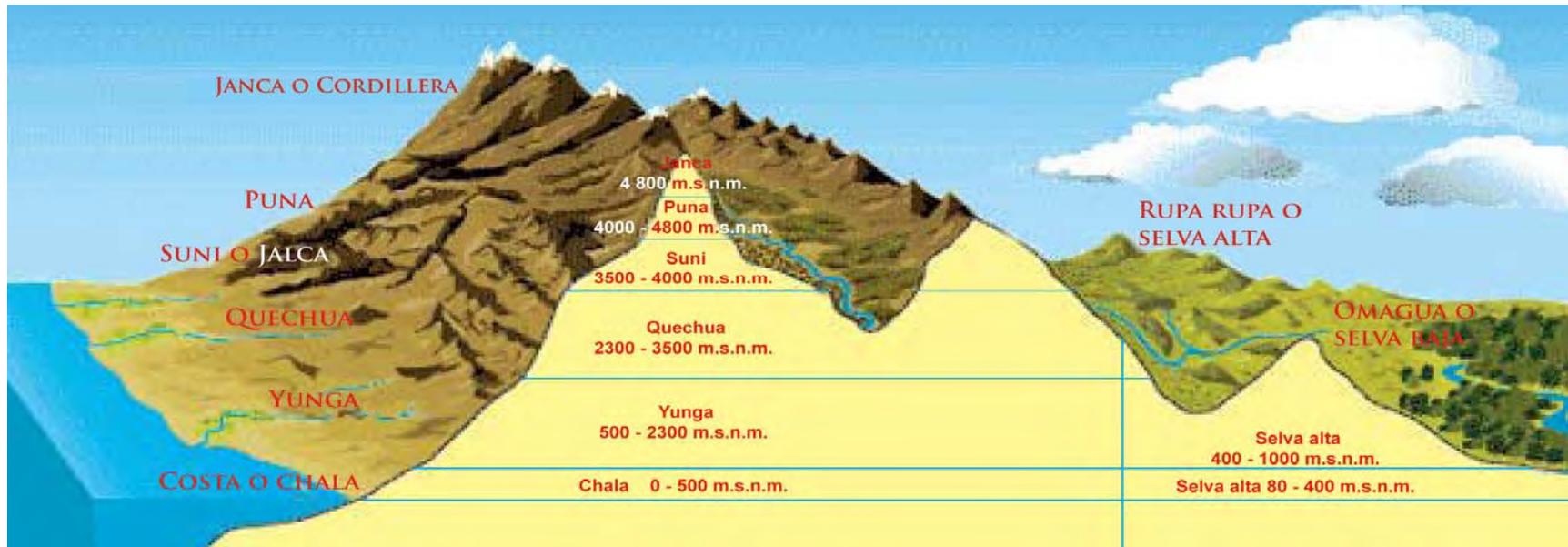
Durante la inauguración de la muestra, el titular de **Cultura** destacó los provechosos resultados de la alianza entre Estado y empresa privada. **"Esta exposición es un ejemplo de la responsabilidad de una empresa privada en cuanto a la protección del patrimonio cultural"**, dijo.

El proyecto de **PERU LNG** se ejecutó bajo la supervisión del **Ministerio de Cultura**, y comprendió la **planta Melchorita** y los **408 kilómetros de gaseoducto** que atraviesan **Lima, Ica, Huancavelica y Ayacucho**. La empresa se responsabilizó de reducir al mínimo cualquier impacto que pudieran tener los bienes culturales por efecto de sus actividades.

La ceremonia de inauguración se realizó en la **Sala Paracas** del **Museo de la Nación** y contó con la presencia del ministro de Energía y Minas, Pedro Sánchez, y el embajador de China, Zhao Wuyi. La muestra estará abierta hasta el 21 de agosto, de **martes a domingo** en el horario de **9:00 de la mañana** hasta las **5:00 de la tarde**.

(LaRepublica.pe)

Newspaper article on the exhibition at the Museo de la Nación in Lima of artifacts recovered during the PERU LNG Archaeological Project



ID	Natural Region	Meters Above Sea Level	Length (km)	Percentage	Rescue Sites	Density (per km)	Chance Finds	Density (per km)	All Sites	Density (per km)
3	Quechua	2300 - 3500	72.046	17.67%	42	0.58	25	0.35	67	0.93
4	Suni	3500 - 4100	70.695	17.34%	21	0.30	36	0.51	57	0.81
5	Puna	4100 - 4800	141.994	34.83%	54	0.38	38	0.27	92	0.65
1	Chala	0 - 500	82.467	20.23%	10	0.12	34	0.41	44	0.53
2	Yunga	500 - 2300	33.987	8.34%	5	0.15	4	0.12	9	0.26
6	Janca	> 4800	6.504	1.60%	1	0.15	0	0.00	1	0.15
	TOTAL		407.693	100.00%	133	0.33	137	0.34	270	0.66

Distribution of PERU LNG Sites by Natural Region

Functional Component/ Site Type	Rescue Sites			Chance Finds			Combined		
	Coast	Sierra	Total	Coast	Sierra	Total	Coast	Sierra	Total
Residences		65	65		24	24		89	89
Artifact scatters	8	7	15	32	18	50	40	25	65
Terraces		38	38		6	6		44	44
Corrals		36	36		3	3		39	39
Road segments	1	18	19		20	20	1	38	39
Small monuments (huancas)	2	12	14		6	6	2	18	20
Burials	2	7	9	5	3	8	7	10	17
Isolated walls					10	10		10	10
Windbreaks					6	6		6	6
Civic/ceremonial contexts		5	5					5	5
Lithic scatters	2	2	4				2	2	4
Rockshelters		2	2		1	1		3	3
Ash deposits				1	1	2	1	1	2
Lithic quarry					1	1		1	1
Roadhouse (tambo)		1	1					1	1
Unknown		2	2					2	2
Number of Components	15	195	210	38	99	137	53	294	347
Number of Sites	15	118	133	38	99	137	53	217	270

Distribution of Sites by Functional Component/Site Type (n=270)

Period	Culture/Ceramic Type	Rescue Sites			Chance Finds			Combined		
		Coast	Sierra	Total	Coast	Sierra	Total	Coast	Sierra	Total
Initial Period (c. 1800-1000 B.C.)										
	Andamarca		1	1					1	1
	Wichqana A		1	1					1	1
Early Horizon (c. 1000-200 B.C.)										
	Wichqana B		2	2					2	2
	Chupas		6	6					6	6
	Paracas (700 B.C.-A.D. 1)	2		2	17		17	19		19
	Undefined		1	1					1	1
Early Intermediate Period (200 B.C.-A.D. 600)										
	Rancha (early EIP)		7	7					7	7
	Warpa (late EIP)		12	12		2	2		14	14
	Nazca (A.D. 1-700)	2		2				2		2
	Carmen (late EIP)				3		3	3		3
	Estrella (late EIP)	2		2	8		8	10		10
Middle Horizon (A.D. 600-1000)										
	Wari	2	14	16	7	3	10	9	17	26
	Undefined									
Late Intermediate (A.D. 1000-1450)										
	Chanka		14	14		7	7		21	21
	Chincha	3		3	9		9	12		12
	Undefined				1	1	2	1	1	2
Late Horizon (A.D. 1450-1532)										
	Chincha-Inka	1		1				1		1
	Inka	1		1	1		1	2		2
Colonial (A.D. 1532-1821)										
	Colonial		3	3	4		4	4	3	7
Number of Components		13	61	74	50	13	63	63	74	137
Number of Sites		6	31	37	22	11	33	28	42	70

Distribution of Sites by Time Period and Culture/Ceramic Type (n=70)

Results of the Settlement Pattern Analysis

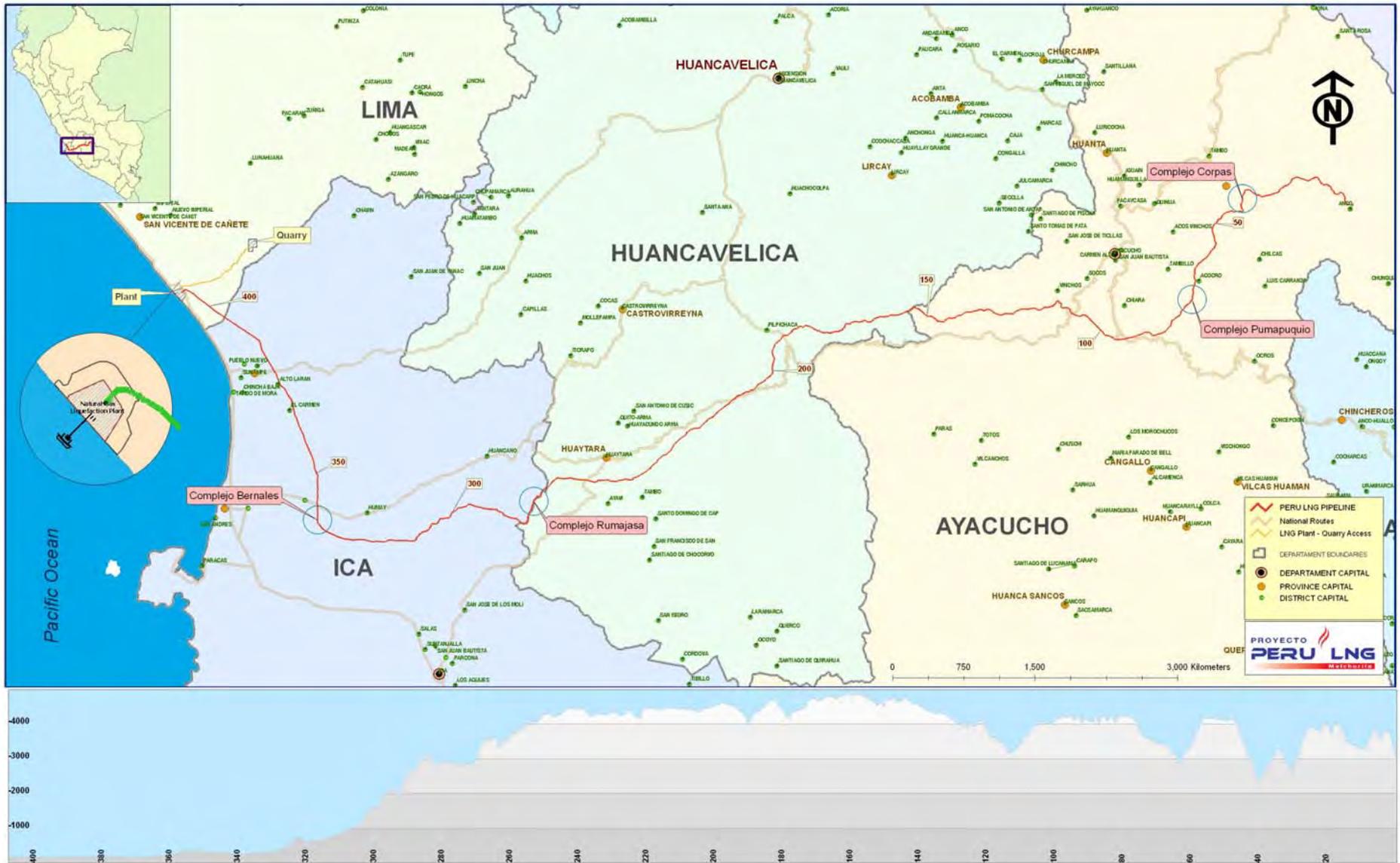
Part I: Non-Temporal Analyses (n=270)

- Highest site density is in the Quechua region, which is ideal for maize-based agriculture. Excluding the Janca region, the lowest site density is in the Chala region.
- Site density is higher in every valley and watershed than in any of the other ecozones. There is also a fairly strong relationship between site density and the presence of streams and especially rivers.
- Terraces are most common in the Quechua regions and corrals in the Puna region. Both are found in the Suni region, indicating a mixed subsistence strategy in this intervening region.

Results of the Settlement Pattern Analysis

Part II: Temporal Analyses (n=70)

- Pisco and Chincha valleys were located within the Nazca sphere of influence but outside the Nazca heartland during the EIP. Nazca ceramics recovered from only two sites in the Yunga region that were also associated with Estrella ceramics.
- In the highlands, increase in the percentage of sites with residential architecture and terraces from EH to MH. Terraces especially common at Warpa and Wari sites in the Quechua region.
- Percentage of sites with residential architecture decreases during the LIP. Also a shift from low elevation (Quechua region) to high elevation (Suni and especially Puna regions) areas, supporting the assertion that Chanka allied groups shifted from maize-based agriculture to agro-pastoralism. But there are still more Chanka sites in the Quechua region than in the Puna region, indicating that Chanka allied groups continued to cultivate maize in the LIP.



Map of major archaeological complexes



Aerial photograph of the Corpas Complex



Unexcavated ceremonial precinct of the Corpas Complex



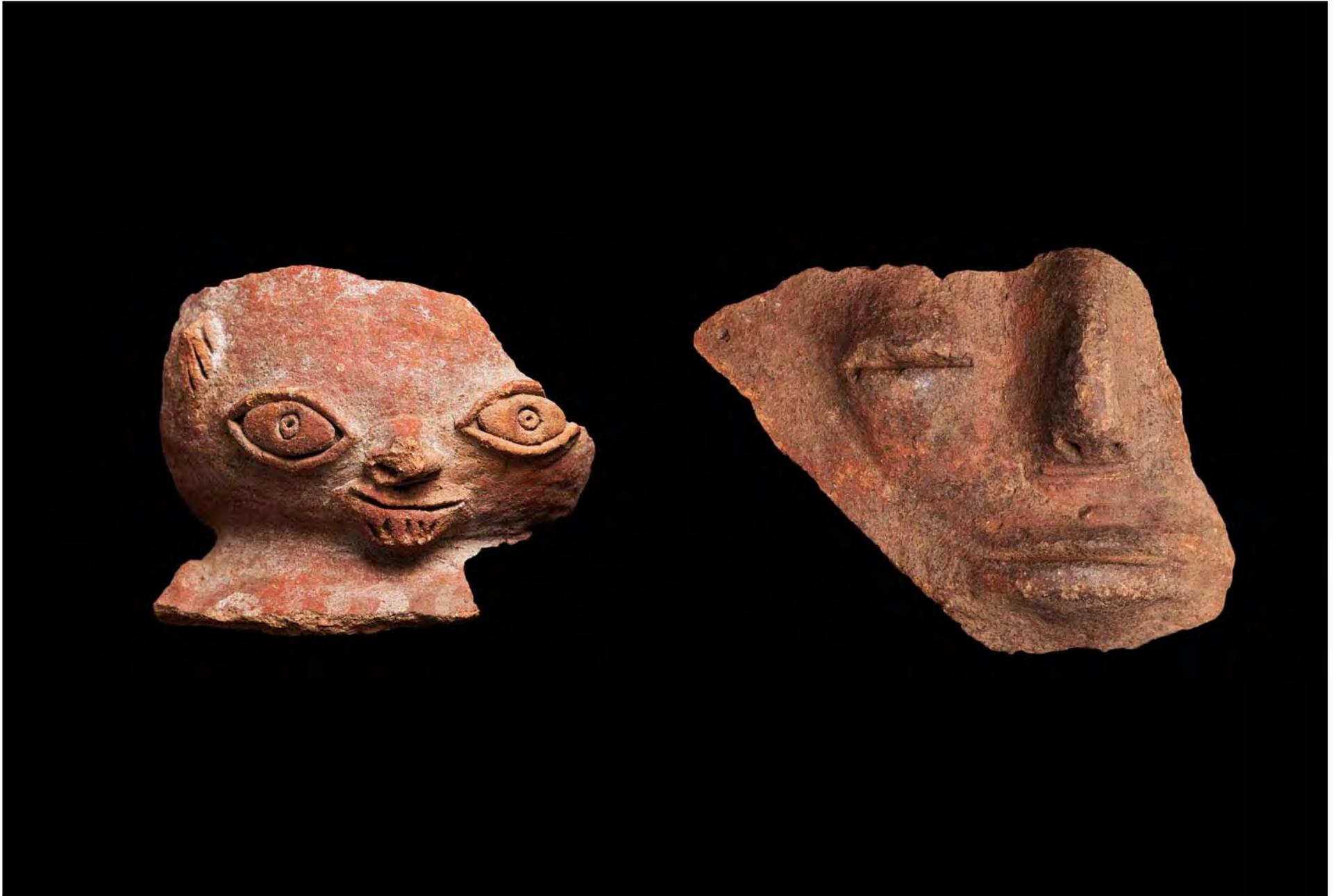
Excavation of Corpas 4 (Corpas Complex)



Warpa pitchers and bone musical instrument recovered from Corpas 4



Excavated agricultural terraces at Pampahuaylla (Corpas Complex)



Ceramic sherds recovered from Pampahuaylla



Excavated structures at HF S30 – Ayquihuilca (Corpas Complex)



The Pumapuquio Complex



Aerial photograph of elite architecture at Pumapuquio (Pumapuquio Complex)



Excavation of elite architecture at Pumapuquio (Pumapuquio Complex)



Recordation of elite architecture at Pumapuquio (Pumapuquio Complex)



Warpa (EIP), Chakipampa, Wari Local, and Huamanga (Wari) ceramics, and a ceramic figurine, recovered from Islacha 1



Lithic artifacts recovered from Islacha 1



Warpa and Ocros (EIP) ceramics recovered from Pumapuquio



Chakipampa (Wari) ceramic vessels and figurines recovered from Pumapuquio



Wari Local ceramics recovered from Pumapuquio



Wari Black ceramic vessels, figurines, and whistle recovered from Pumapuquio



Wari Black ceramic cups recovered from Pumapuquio



Wari Black ceramic bowls recovered from Pumapuquio



Huamanga (Wari) ceramic vessels and figurine recovered from Pumapuquio



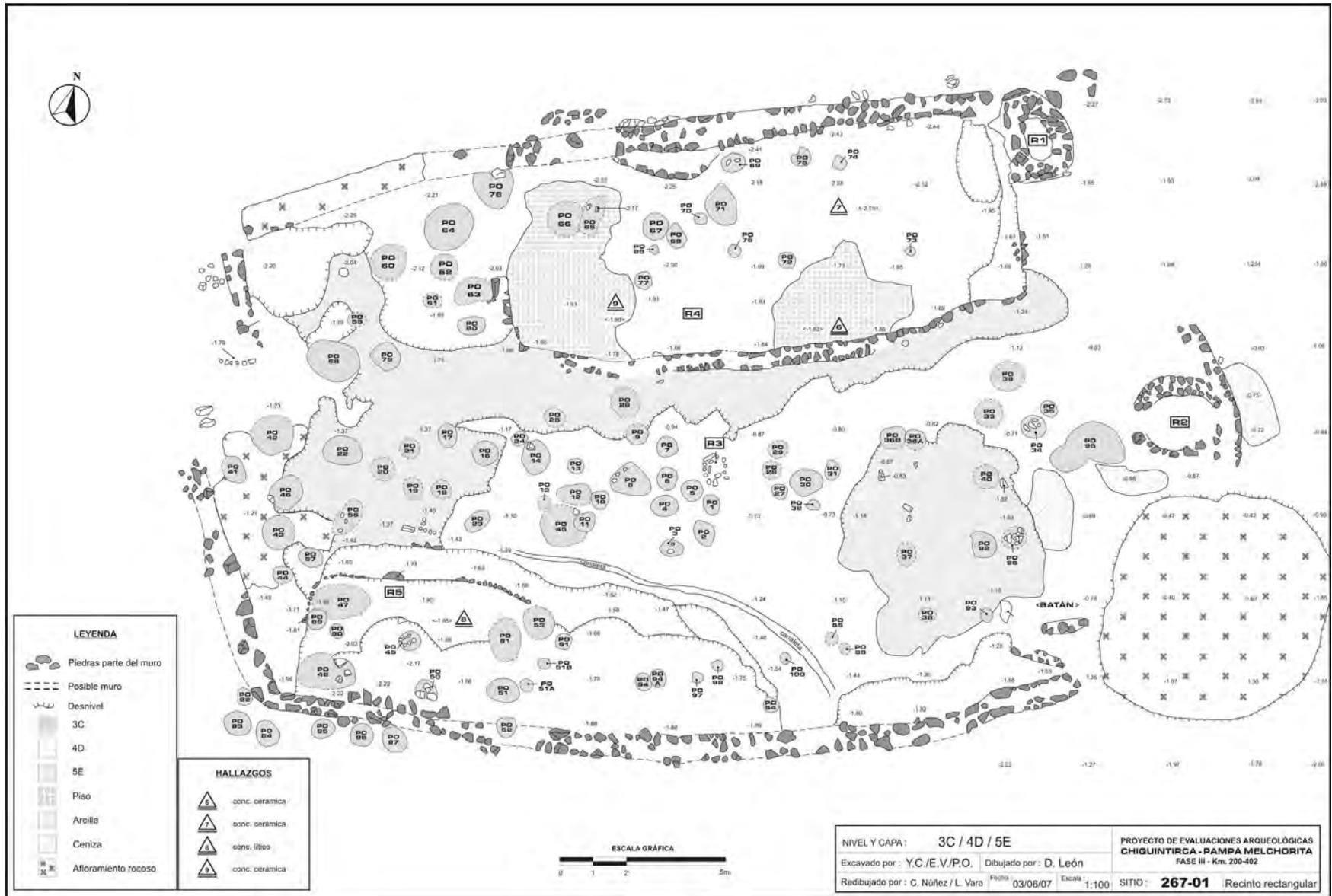
Other artifacts recovered from Pumapuquio



Aerial photograph of Rumajasa 10 (Rumajasa Complex)



Excavation of the rectangular building at Rumajasa 10 (Rumajasa Complex)



Map of the rectangular building at Rumajasa 10 (Rumajasa Complex)



Excavation of secondary burials at Rumajasa 10 (Rumajasa Complex)



Excavation of secondary burials at Rumajasa 1 y 2 (Rumajasa Complex)



Artifacts recovered from Rumajasa 10



Unexcavated adobe pyramid near the Bernales Complex



Excavations at Bernales 1 (Bernales Complex)



Artifacts recovered from Bernales 1

› Conchas ubicadas en los sitios de Bernales 1, Pampa Jahuay 1 y Pampa Jahuay 2A.

Shells from the sites of Bernales 1, Pampa Jahuay 1 and Pampa Jahuay 2A.



Arriba:
Concha abanico
(*Argopecten* sp.)
Medio:
Equinodermo
(Echinodermata)
Abajo:
Chanque abulón
(*Sinum cymba*)
Top:
Scallop
(*Argopecten* sp.)
Middle:
Echinoderm
(Echinodermata)
Bottom:
Moon snail
(*Sinum cymba*)

Arriba izquierda:
Mejillón
(*Mytella* sp.)
Arriba derecha:
Lapa
(*Fissurella* sp.)
Abajo izquierda:
Caracolito negro
(*Prisogaster niger*)
Abajo derecha: Caracol
porcelana
(*Prunum curtum*)
Top Left:
Mussel
(*Mytella* sp.)
Top Right:
Keyhole limpet
(*Fissurella* sp.)
Bottom Left:
Turban snail
(*Prisogaster niger*)
Bottom Right:
Margin snail
(*Prunum curtum*)



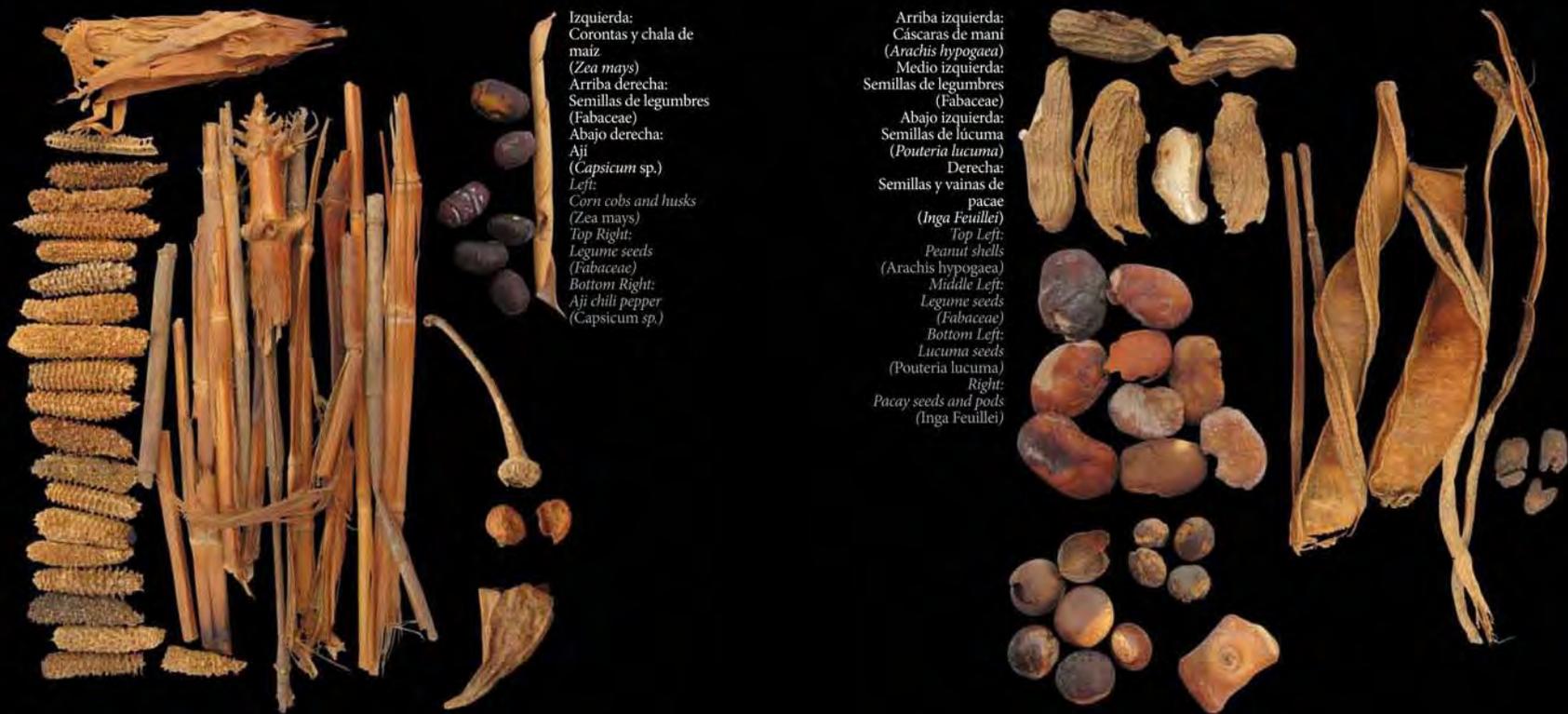
Shells recovered from Bernales 1 and other coastal sites



Shells recovered from Bernales 1 and other coastal sites

› Restos botánicos ubicados en Bernales 1, Pampa Jahuay 1 y Pampa Jahuay 2A.

Botanical remains from Bernales 1, Pampa Jahuay 1 and Pampa Jahuay 2A.



Botanical remains recovered from Bernales 1 and other coastal sites



Excavations at Kiccaorcco



Feature at Kiccaorcco



Warpa (EIP) ceramics recovered from Kiccaorcco



Excavation of Pampa Melchorita at the Plant



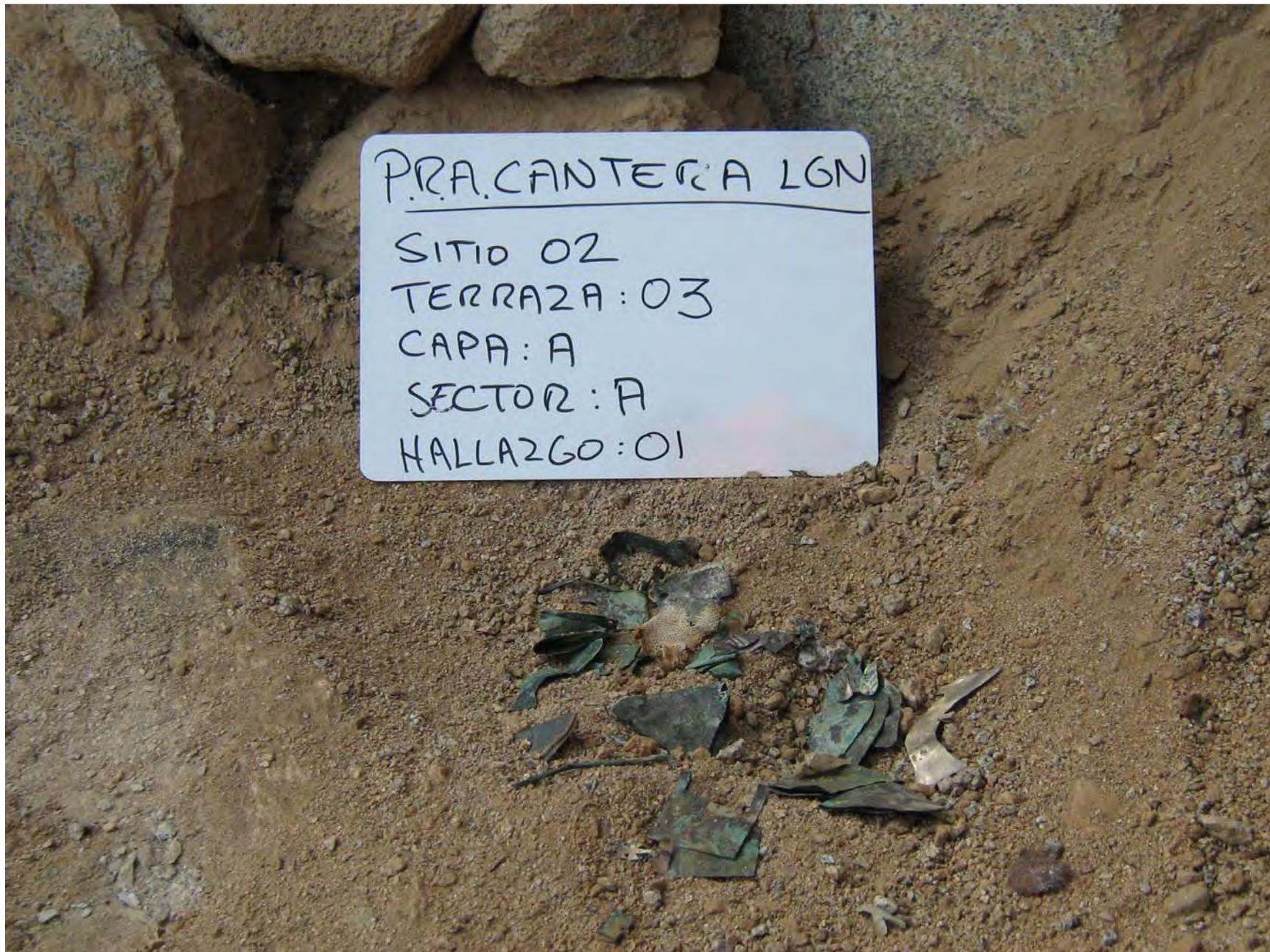
Inka pitchers and other artifacts recovered from Pampa Melchorita



Excavation of Sitio 2, Sector A at the Quarry



Excavation of Sitio 2, Sector B at the Quarry



Artifact cache from Sitio 2, Sector A



Metal ornaments and miniature textile “unku” shirt recovered from Sitio 2



Artifacts recovered from Mayopampa 1



Ocros (EIP) bowl, Qachisco (Chanka) miniature pitcher, and ceramic figurine recovered from chance finds

Thank You!

