

## Research Article

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# Analysis by pXRF of Prehistoric Obsidian Artifacts From Several Sites on Ustica (Italy): Long-Distance Open-Water Distribution From Multiple Island Sources During the Neolithic and Bronze Ages

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**Abstract:** The small island of Ustica was a regular part of the obsidian distribution network in the central Mediterranean, despite its location more than 50 km north of western Sicily. More than 1000 obsidian artifacts from several different sites, ranging in age from the Neolithic through Bronze Age, were analyzed using a non-destructive, portable X-ray fluorescence spectrometer. Obsidian from Lipari-Gabellotto dominates the assemblages at all sites tested, yet Pantelleria obsidian from both Balata dei Turchi and Lago di Venere are of notable quantities. Obsidian was not likely a major part of the material transported across open waters to this seemingly remote location, while our data support the hypothesis that some direct travel occurred from the Aeolian Islands to Ustica.

**Keywords:** Ustica, obsidian, pXRF, Lipari, Pantelleria, trade, Neolithic, Bronze Age

## 1 Introduction

The small island of Ustica, just 8.6 km<sup>2</sup> and 52 km north from Sicily, apparently was a regular part of the obsidian distribution network in the central Mediterranean that continued for several thousand years. Occupation began in the Neolithic period, as it did on many islands within the Tyrrhenian Sea, and obsidian from both Lipari and Pantelleria has been identified on Ustica (Figure 1). The great distances traveled over land and sea represent the maritime capabilities established by 6000 BCE, which involved not only obsidian but also domesticated plants and animals, as well as perishable materials (Tykot, 2017b).

Over the last four years, more than 1100 obsidian artifacts from seven archaeological site areas on Ustica were analyzed non-destructively using a portable, hand-held, X-ray fluorescence spectrometer to determine the specific geological sources and sub-sources that were utilized. These sites represent at least four different cultural time periods, from the Neolithic through the Middle Bronze Age, allowing us to chronologically compare the usage of obsidian from different sources, as well as with other sites in Sicily.

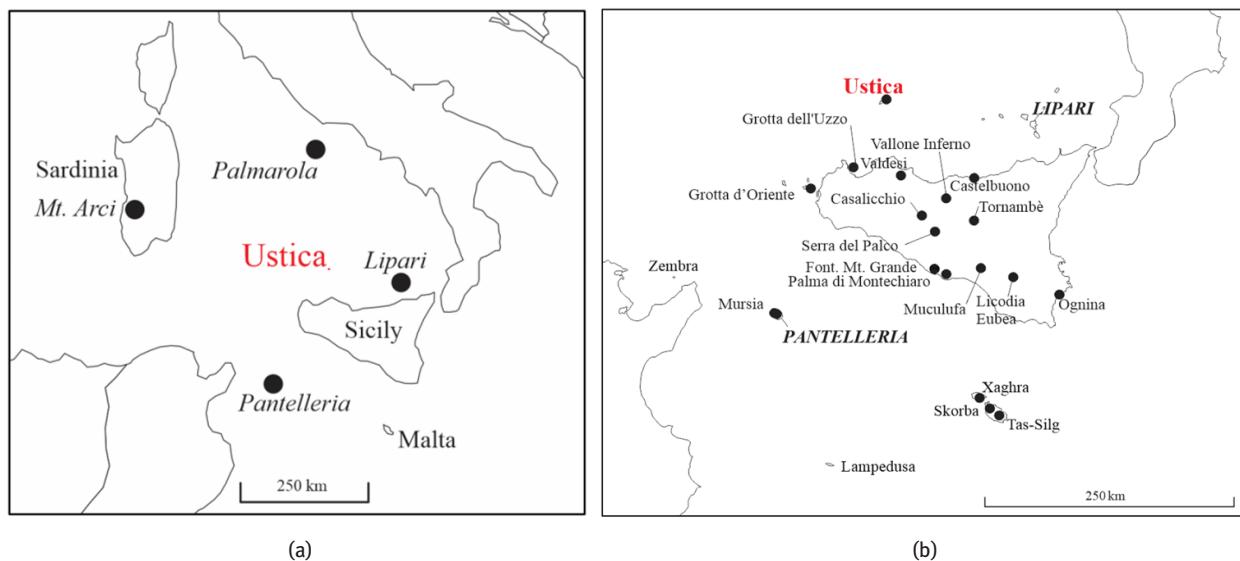
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**Figure 1:** **A)** Map of obsidian sources and islands in the central Mediterranean. **B)** Archaeological sites in Sicily, Malta & Tunisia with  $\geq 25$  artifact analyses and at least some Pantelleria obsidian.

## 2 Archaeological Background

The presence of obsidian artifacts on Ustica has been known for a long time, and two flakes that had been collected on the surface by Miss Kay Miall were analyzed and attributed to Lipari as part of early obsidian sourcing studies by Colin Renfrew and colleagues using optical emission spectroscopy (Dixon, et al., 1968) and neutron activation analysis (Hallam, et al., 1976). Obsidian later was found on the surface during excavations at the Middle Bronze Age site of I Faraglioni led by Ross Holloway and Susan Lukesh (1995), and minimally destructive analysis of 12 artifacts using an electron microprobe (EPMA) with a wave-length dispersive spectrometer identified 11 as coming from Lipari and 1 from Pantelleria (Tykot, 1995). Over the last 25 years, further survey and excavation on Ustica has revealed the presence of obsidian at seven locales dating from the Neolithic through the Middle Bronze Age (Tykot & Foresta Martin, 2017; Foresta Martin & La Monica, 2019).

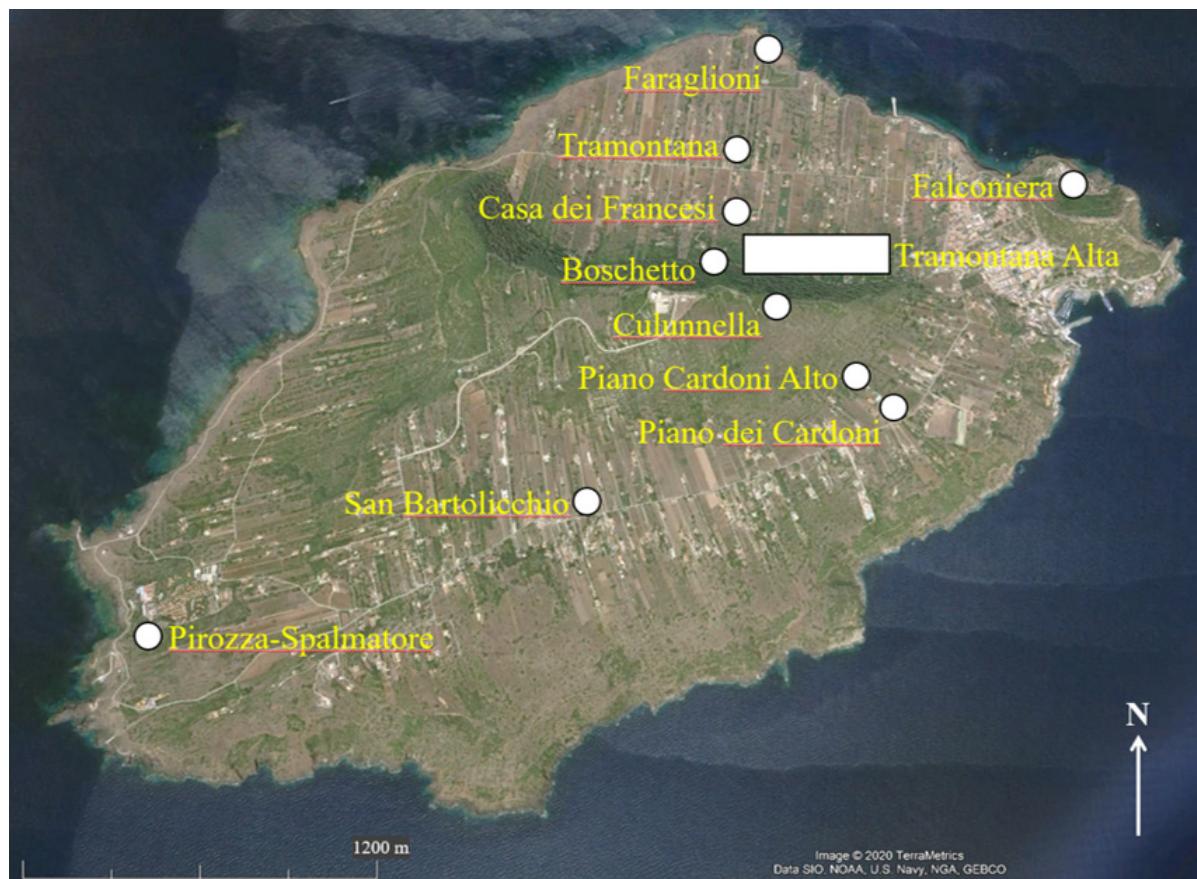
### 2.1 Archaeological Sites on Ustica

Archaeological investigations carried out on Ustica suggest that prehistory was a period of relatively intense human habitation. The presence of humans at Ustica is documented since the Neolithic Age (~8 ka), then in the Late Neolithic Age (~6–5 ka), Early Bronze Age (~4 ka) and Middle Bronze Age (~3.4–3.2 ka) (Spatafora, 2009; Spatafora & Mannino, 2008; Mannino & Ailara, 2016). In most cases, the location of prehistoric settlements has been deduced only from the abundance of ceramic sherds and/or lithic fragments found on the land surface in some areas of the island. Only in a few cases has the existence of prehistoric settlements been shown, thanks to campaigns of archaeological excavations that have revealed the remains of huts and villages.

We acknowledge the limitations of studying surface collections, which are filtered by various factors. When obsidian artifacts are collected, their luster varies based on the possible washout from recent rain, as well as the glassier nature of obsidian from Lipari than from Pantelleria. The collectors varied in this study, with differences in their training and experience (many with none), along with a general trend to collect objects with elongated rather than rounded shapes. Obsidian artifacts from surface collections in agricultural fields are affected by the mechanical tools used for plowing, with shattering into smaller and smaller pieces, and a thorough investigation of each fragment under the microscope necessary to distinguish recent breakage from ancient waste flakes. Yet while surface collections have many limits,

when abundant and concentrated they cannot be ignored, as an examination may reveal differences between sites and lead to future excavation and discovery.

In this paper, focused on obsidian studies, we indicate in chronological order those sites that are considered the main prehistoric settlements of Ustica, and some areas of concentration of abundant obsidian lithic finds not accompanied by other evidence of human settlements (Figure 2).



**Figure 2:** Map of Ustica showing prehistoric sites with obsidian. Modified from Google Earth.

### 2.1.1 Pirozza-Spalmatore – Neolithic Settlement

The earliest known settlement on Ustica was on its western side, at 50 m asl on the flat top of Pirozza hill, a small promontory facing the sea in the southwestern sector of Punta Spalmatore (Figure 3). Observed from the sea, it appears like a fortress because it is made of columnar basalts whose formation occurred ~300 ka. Later, ~210 ka, the top of the hill was naturally leveled by a Crotonian marine transgression (de Vita, 1993; de Vita & Orsi, 1996; Foresta Martin, 2014).

Archaeological excavations have not been carried out on Pirozza hill, but abundant surface finds of ceramic sherds belong to three styles of pottery: Stentinello, Trichrome, and Diana, typical of the Sicilian Neolithic period. Based on the stylistic analogies of these ceramic finds, some archaeologists suggest that the first settlers on Ustica came from Sicilian Neolithic villages near Palermo (Mannino, 1998). These people settled on the naturally protected Pirozza hill for defensive reasons, to dominate the south-western sector of Ustica and control the sea between Sicily and the island (Foresta Martin & Furlani, 2020). The settlement lasted for a long time, and during the subsequent prehistoric periods, it expanded into the surrounding areas nowadays occupied by a touristic village, as shown by ceramic fragments found around the site (Spatafora & Mannino, 2008; Mannino & Ailara, 2016).



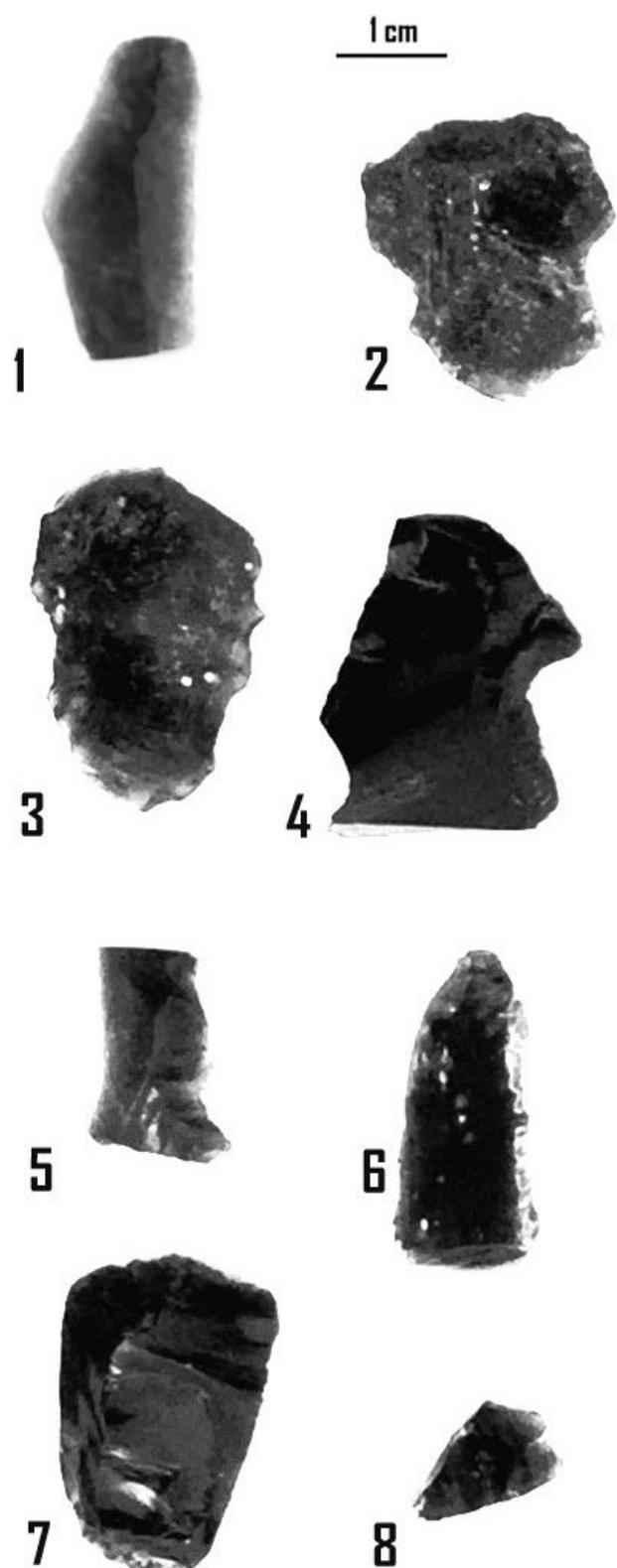
**Figure 3:** View by drone of the Pirozza-Spalmatore hill, on the southwestern side of Ustica, the first known place of Neolithic colonization on Ustica (courtesy of INGV Remote Sensing Laboratory, Rome, Italy).

In the same area of Pirozza where Neolithic pottery was found, fragments of obsidian tools and waste fragments were also discovered (Mannino, 1998) and analyzed (Foresta Martin & Tykot, 2019). As the volcanism of Ustica did not produce volcanic glass, provenance areas of obsidian at this site were determined through geochemical analyses to be Lipari and Pantelleria, and attesting to the far exchanges between Ustica and these two Sicilian islands since the beginning of the Neolithic (Foresta Martin & Tykot, 2019). Twenty-eight obsidian artifacts associated with the Neolithic ceramics were analyzed, plus one near a Byzantine locale (Figure 4).

### 2.1.2 Piano dei Cardoni – Late Neolithic & Copper Age Settlement

Another key place of prehistoric presence on Ustica is the marine terrace of Piano dei Cardoni, on the southern hinterland of the island, which extends from a cliff overlooking the sea up to the slopes of Monte Guardia dei Turchi (248 m asl), the main and central relief of Ustica (Figure 5). The bedrock is made by the basalts of Monte Guardia dei Turchi (~520 ka), which is covered by Crotonian marine terrace deposits (~350 ka) (de Vita 1993; de Vita & Orsi, 1996; Foresta Martin, 2014). The geomorphological features of the area, sloping toward the sea without obstacles, demonstrate reduced defensive needs, which were entrusted only to the high coast overlooking the sea (Foresta Martin & Furlani, 2020).

Until recently, the knowledge of the archaeological history of this part of the island was based exclusively on the presence of ceramic surface finds, emerging from a vast slope area at 80–100 m asl. Some of these ceramic fragments have been attributed to the so-called Conca d’Oro style, dating back to the 4th–3rd millennium BC, which is the Copper Age (or Chalcolithic) period (Spatafora & Mannino, 2008; Mannino & Ailara, 2016). But during 2019–2020, a new excavation at Piano dei Cardoni (38°42'23" N, 13°11'20" E, 103 m asl) brought to light artifacts of the Late Neolithic Age (Speciale, et al., 2020, this special volume). All these findings suggest the presence of a prehistoric settlement that arose towards the end of the Neolithic, continued during the Copper Age and probably also during subsequent periods of prehistory (Spatafora & Mannino, 2008; Mannino & Ailara, 2016). Over many years, thanks to several surface surveys



**Figure 4:** Some obsidian artifacts from Pirozza-Spalmatore (collected on garden surface by Foresta Martin). 1=USF28662, Lipari-Gabellotto, blade; 2=USF28671, Lipari-Gabellotto, flake; 3=USF28666, Lipari-Gabellotto, flake; 4=USF28661, Pantelleria-Lago di Venere, flake; 5=USF28665, Lipari-Gabellotto, blade; 6=USF28663, Lipari-Gabellotto, flake; 7=USF28660, Lipari-Gabellotto, flake; 8=USF28677, Lipari-Gabellotto, waste.



**Figure 5:** The countryside of Piano dei Cardoni, on the southern side of the island of Ustica, was the site of settlements of the Late Neolithic and Copper Age (courtesy of Giacomo Pignatone).

conducted in the Piano dei Cardoni area, abundant obsidian fragments were also collected, and attributable to Lipari and Pantelleria outcrops. One hundred and thirty-four obsidian artifacts came from places at 110–120 m asl (Piano dei Cardoni Alto), far from the road; twenty-four more obsidian fragments were collected by Foresta Martin and students of a Milanese school visiting Ustica in June 2018 from an agricultural field in Piano dei Cardoni, at an altitude of 90 m asl, close to the main road, following a report of the presence of obsidian fragments by the landowner, Mr. Catiello. We note that the obsidian artifacts found on the surface of Piano dei Cardoni are very mixed, perhaps originally from different nearby settlements. When it rains, there is a lot of transport of material from high altitudes towards the road.

### 2.1.3 Culunnella – Early Bronze Age Settlement

During the Early Bronze Age (~4 ka), the population of Ustica returned to defensive sites. The only known settlement referable to this period is located on a small relief called Culunnella (Figure 2). From a geological point of view, Culunnella is the relict of a volcanic crater situated close to the central mount of the island (Monte Guardia dei Turchi), at an altitude of about 238 m asl, and locally named “U Vurcanu” (Foresta Martin, 2014). The top of the hill was reworked by human intervention and its perimeter was protected by basalt block counterforts. From that position, a 360° view of the horizon is possible, to control the island and its landing sites (Spatafora & Mannino, 2008; Mannino & Ailara, 2016; Foresta Martin & Furlani, 2020).

The importance of this settlement is attested by ceramic finds in the style of Capo Graziano (from an Aeolian Islands toponym), and by the presence of a necropolis with grotticelle tombs in which ceramics from the same age were recovered (Mannino, 1998; Spatafora & Mannino, 2008; Mannino & Ailara, 2016). No archaeological excavations have been carried out, with the ceramics and four obsidian finds coming from surface collections.

### 2.1.4 I Faraglioni – Middle Bronze Age Settlement

The most populated prehistoric settlement on Ustica was the I Faraglioni village of Tramontana, which was built during the Middle Bronze Age (~3.4 BP) and is located on a terrace bordered by a 20 m high cliff overlooking the northern coast of the island (Spatafora, 2014; Spatafora & Mannino, 2008; Mannino & Ailara, 2016) (Figure 6).

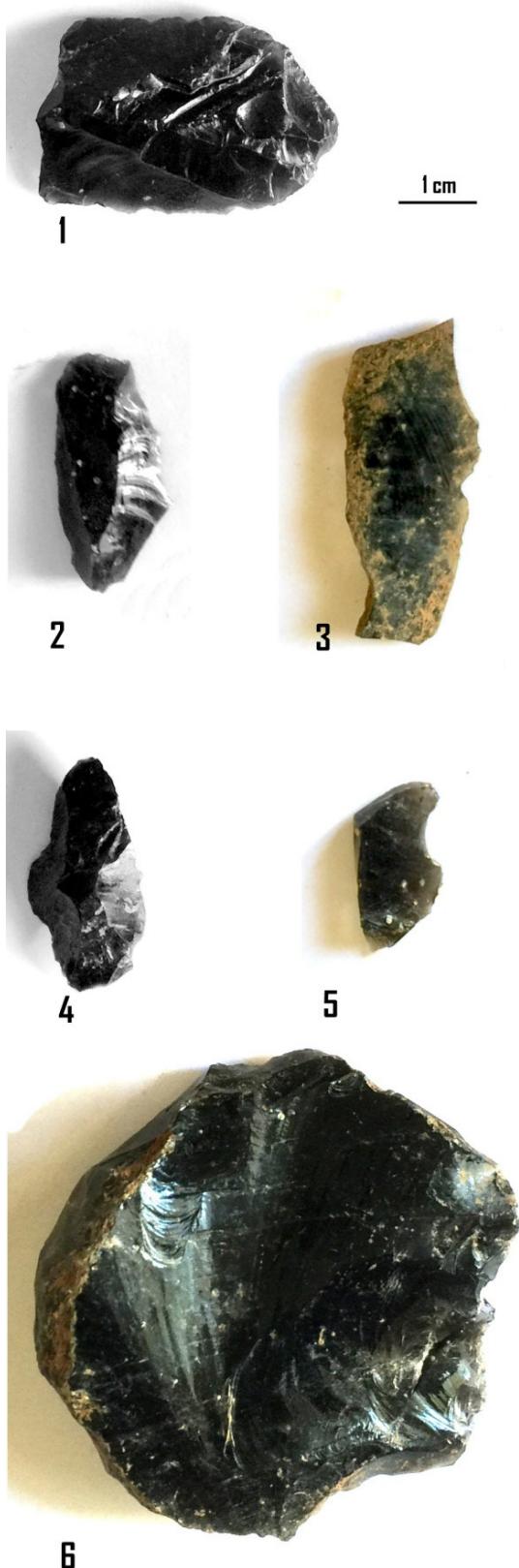


**Figure 6:** Aerial view of the Middle Bronze Age I Faraglioni village, in the northern sector of Ustica. In the central-left part of the photo are the huts revealed by archaeological excavations (courtesy of INGV Remote Sensing Laboratory, Rome, Italy).

This sector of the coast is formed by the columnar lavas of the Salato Gorge and Tramontana units whose formation dates to 320–300 ka, and which are affected by repeated collapses (de Vita, 1993; Foresta Martin, 2014). One of the reasons for the choice of that place is probably related to its topographical and morphological characteristics, including natural protection due to the sea cliffs. The structural weakness of the cliffs, however, are characterized by frequent collapses, perhaps the reason for the sudden abandonment of the village ~3.2 ka, two centuries after its foundation. Other reasons for this still unexplained abandonment cannot be excluded (Foresta Martin & Furlani, 2020).

The village at I Faraglioni is the largest and richest prehistoric settlement found so far at Ustica (Spatafora & Mannino, 2008; Mannino & Ailara, 2016; Spatafora, 2016). Archaeological excavations carried out since the 1970s by Mannino (1970, 1979, 1982), Holloway and Lukesh (1995, 2001) and Spatafora (2014) highlight a settlement that has been defined as one of the best-preserved Middle Bronze Age sites in the Mediterranean (Holloway & Lukesh, 1995, 2001). Excavations have unearthed dozens of huts and courtyards, organized along main longitudinal roads. Northward the settlement was naturally protected by the sea cliff; southward it was defended by a massive fortification wall that delimits an area of about 7000 square meters. It is estimated that a few hundred people lived in the Faraglioni village, which was part of the Tyrrhenian commercial routes that connected western Sicily with the Aeolian Islands, eastern Sicily, and the Italian peninsula (Holloway & Lukesh, 1995, 2001; Spatafora & Mannino, 2008; Spatafora, 2016).

The furnishings unearthed inside the huts were rich and well-preserved. Some vases recall the style of coeval ceramics found at the Milazzese village on Panarea, one of the Aeolian Islands; some other vases are in typical Thapsos style, consisting of deep truncated cone bowls on high trumpet feet. The ceramic typology and the organization of living testify to a community devoted to fishing, agriculture and sheep farming (Holloway & Lukesh, 1995, 2001; Spatafora & Mannino, 2008; Spatafora, 2016). The lands on which the I Faraglioni village stands also returned abundant tools and fragments of obsidian artifacts, collected both in situ and on the surface. It was thanks to the analyses carried out on these samples that the presence of obsidian from Pantelleria was highlighted for the first time in Ustica, albeit in smaller proportions than the imports from Lipari (Tykot, 1995; Pappalardo, et al., 2013; Tykot & Foresta Martin, 2017). An additional 204 were tested in this study (Figure 7).



**Figure 7:** Some obsidian artifacts from Villaggio I Faraglioni. 1=USF29070, Lipari-Gabellotto, wide blade; 2=USF29084, Lipari-Gabellotto, wide blade; 3=USF29089, Lipari-Gabellotto, blade; 4=29001, Pantelleria-Balata dei Turchi, waste; 5=29054, Lipari-Gabellotto, waste; 6=USF28955, Lipari-Gabellotto, big chunk.

### 2.1.5 Falconiera – Middle Bronze Age Settlement

About 1.5 km away east of the I Faraglioni village, a small contemporary settlement has been identified in a flat area inside the extinct Falconiera crater where, during excavations for the construction of a wastewater treatment plant, huts and ceramic finds were located (Mannino & Ailara, 2016) (Figure 2). Probably it was a settlement of agricultural vocation, whose relations with the large and near I Faraglioni are unknown.

### 2.1.6 San Bartolicchio

San Bartolicchio is a Chapel placed in the Oliastrello district. In this area, eleven obsidian artifacts have been found, but not associated with any prehistoric settlement. The only other archaeological finds in this place are a fourth century AD necropolis, and ceramic fragments of the Late Roman period.

### 2.1.7 Tramontana and Boschetto – Obsidian Fields

Boschetto is a narrow and long pathway, at 80 m asl, between the Tramontana plain and the northern side of Monte Guardia dei Turchi, that begins at Case Vecchie and ends at Passo della Madonna. In the first part of this pathway were found a lot of obsidian fragments, especially on some private properties (Di Bartolo, Maggiore, Lauricella). These places are in *Tramontana Alta*, the highest part of the Tramontana plain (Figure 2). The nearest prehistoric settlement is the Early Bronze Village with the Necropolis of Culunnella, which is right above (~230 m asl) the agricultural fields of Boschetto-Tramontana Alta so rich in obsidian fragments.

An area of about 500 m<sup>2</sup>, between the Tramontana eastern plain and Boschetto footpath, in the north-eastern sector of the island of Ustica (Figure 2), is characterized by the presence of abundant obsidian fragments that emerge from agricultural land, especially after periodic plowing or intense rains (Foresta Martin & La Monica, 2019). So far, no evidence of prehistoric settlements has been reported in this vast area; only fragments of late Roman pottery, datable between the 4th and 5th centuries AD (Spatafora & Mannino, 2008; Mannino & Ailara, 2016), emerge on the surface of the agricultural lands.

A provenance study on 119 obsidian fragments collected in this area, near the Late Roman farmhouse Casa dei Francesi, indicates exclusively two source areas: 93 samples (78%) from Lipari, and 26 samples from Pantelleria (22%), which along with Tramontana Alta have the highest percentages of obsidian imported from Pantelleria so far ascertained at Ustica (Foresta Martin, Larocca, Micheletti, Pallara & Acquafredda, 2020, this issue). Moreover, the high number of obsidian processing waste flakes that characterize the fragments collected in this area could indicate the existence of a nearby lithic workshop (Foresta Martin et al., 2020, this issue).

## 3 Analytical Methods & Results

Over the past several years, we have analyzed 1080 obsidian artifacts from these sites on Ustica, using a non-destructive portable X-ray fluorescence spectrometer. Following just 7 in 2014 (in the Antonino Salinas Regional Archaeological Museum in Palermo), 574 were analyzed in 2016 using a Bruker III-SD; the analytical settings were 40 kV and 11 µA, with samples run for 90–120 seconds while using a filter of 12 mil Al, 1 mil Ti and 6 mil Cu which reduces background and enhances precision for elements from Fe through Nb (Tykot, 2017a, 2017b). Another 421 were analyzed in 2017, with a Bruker Vi model; the analytical settings for this more powerful X-ray instrument were 50 kV and 35 µA, with obsidian samples run for 30 seconds using the same filter; and in 2019, 78 were analyzed using a Bruker Vg, with the same settings as for the Vi. Calibration software for each of these instruments was based on 40 obsidian standards analyzed by multiple methods (INAA, ICP-MS, XRF) at the Research Reactor Lab at the University of Missouri, while an extensive number of geological samples from all Mediterranean/European obsidian sources and sub-sources were analyzed with each Bruker pXRF model and used for direct comparison and source attribution of the obsidian artifacts tested. The calibrated data used for source assignments of all analyzed obsidian artifacts from Ustica sites are provided in

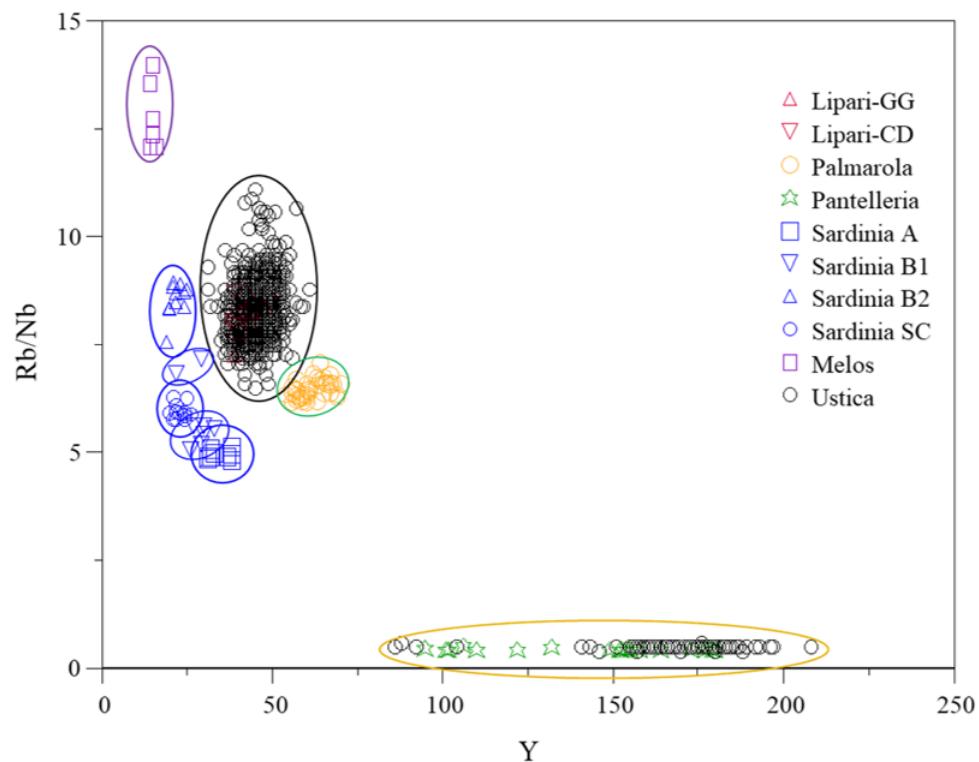
**Table 1:** Summary of the 1080 artifacts in this study from 9 sites and one collection and their source assignments, and 184 from previous publications. Li-G = Lipari-Gabellotto, Li-C = Lipari-Canneto Dentro, Pa-BDT = Pantelleria-Balata dei Turchi, Pa-LdV2 = Pantelleria-Lago di Venere 2, PI = Palmarola (Pontine Island).

Site	Total	% Li	% PA	% PI	Li	Li-G	Li-C	PA	Pa-BdT	Pa-LdV2	PI	USF sample #
unknown	2	100.0	0.0	0.0	2							Hallam et al. 1976
Faraglioni	12	91.7	8.3	0.0	11			1				Tykot 1995
C.G. Seminara collection	170	87.6	11.8	0.6	149			20			1	Foresta Martin et al. 2017
<b>subtotal</b>	184	88.0	11.4	0.5	162			21			1	
Boschetto	54	100.0	0.0	0.0	54	54	0	0	0	0	0	38199–38252
C.G. Seminara collection	129	85.3	14.7	0.0	110	110	0	19	19	0	0	27248–27378
Culunnella	4	100.0	0.0	0.0	4	4	0	0	0	0	0	28925–28927, 31524
Faraglioni	204	88.7	11.3	0.0	181	181	0	23	20	3		21273–7, 28651–4, 28683–7, 28721–32, 28910–24, 28928–90
Piano dei Cardoni	24	91.7	8.3	0.0	22	22	0	2	2	0		38253–38277
Piano dei Cardoni Alto	134	80.6	19.4	0.0	108	108	0	26	26	0		28733–28828, 31485– 31519, 31521–31523
San Bartolicchio	11	54.5	45.5	0.0	6	6	0	5	5	0		28829–28840
Spalmatore	29	89.7	10.3	0.0	26	26	0	3	1	2		28655–28682, 28693
Tramontana	382	90.8	9.2	0.0	347	347	0	35	33	2		31446–31484, 31531– 31876
Tramontana Alta	109	78.0	22.0	0.0	85	85	0	24	24	0		28643–28650, 28688– 28720, 28841–28909
<b>subtotal</b>	1080	87.3	12.7	0.0	943	943	0	137	130	7	0	
<b>Total</b>	1264				1105			158			1	

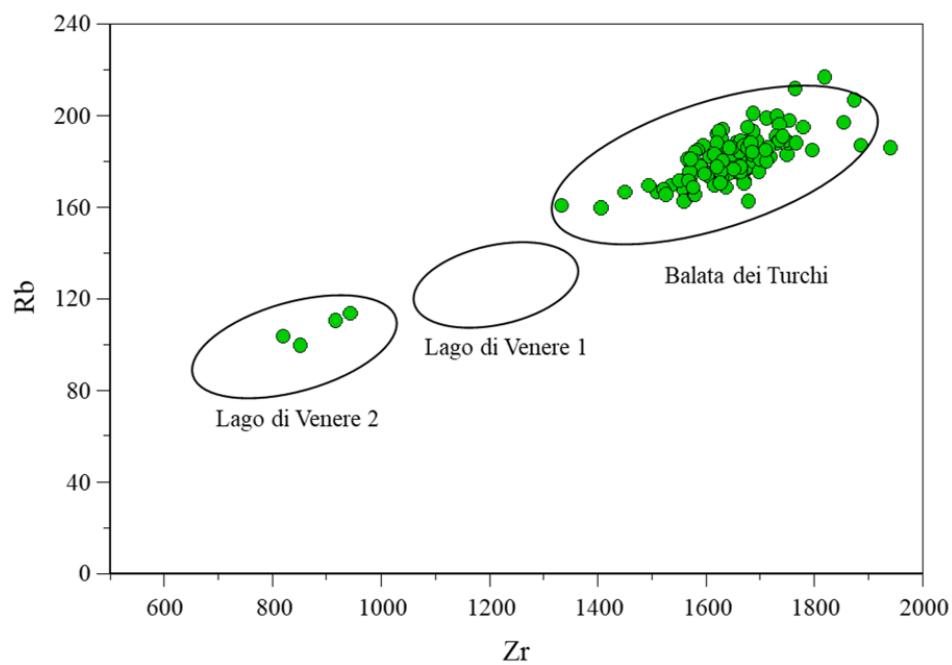
Appendix I. The attribution of all obsidian artifacts tested to specific sources and sub-sources was based on examination of all elements measured and deemed useful for obsidian sourcing in the Mediterranean (Fe, Rb, Sr, Y, Zr, Nb), while multiple graphs of individual elements and/or element ratios may be used as well (Figure 8). For the 1080 obsidian artifacts tested, 87% were assigned to Lipari and 13% to Pantelleria.

It is straightforward to distinguish Pantelleria obsidian from other Mediterranean sources, as it is peralkaline and has far higher amounts of trace elements zirconium (Zr), niobium (Nb), and yttrium (Y) (Table 1). There are actually several chemically distinct sub-sources on Pantelleria, including chronologically separate major flows on the south end of the island at Balata dei Turchi, and two small deposit areas in the northeast near Lago di Venere, with each having different zirconium concentration ranges (Francaviglia, 1988; Tykot, 2017b). Of the 137 artifacts tested in this study that were assigned to Pantelleria, 95% come from Balata dei Turchi, and just 5% (7 artifacts) come from the Lago di Venere 2 sub-source (Figure 9).

Lipari obsidian may be distinguished from other Mediterranean sources using graphs with ratios Rb/Nb vs. Sr/Nb, and the specific concentration of strontium distinguishes between the Lipari subsources of Gabellotto Gorge and Canneto Dentro (Tykot 2017a, 2017b, 2019, 2020). Careful comparison of other sources using the data for all individual elements was performed. Every single artifact tested in our study and assigned to Lipari was attributed specifically to Gabellotto Gorge. None of the 1080 obsidian artifacts from Ustica tested in this study came from Palmarola, as did one from unspecified surface collections of the late C.G. Seminara previously analyzed by Foresta Martin, et al. (2017).



**Figure 8:** Graph of Y vs. Rb/Nb shows obsidian artifacts from Ustica matching with Lipari or Pantelleria.



**Figure 9:** Graph of Zr vs. Rb shows most Pantelleria obsidian artifacts coming from Balata dei Turchi, and a few from Lago di Venere 2.

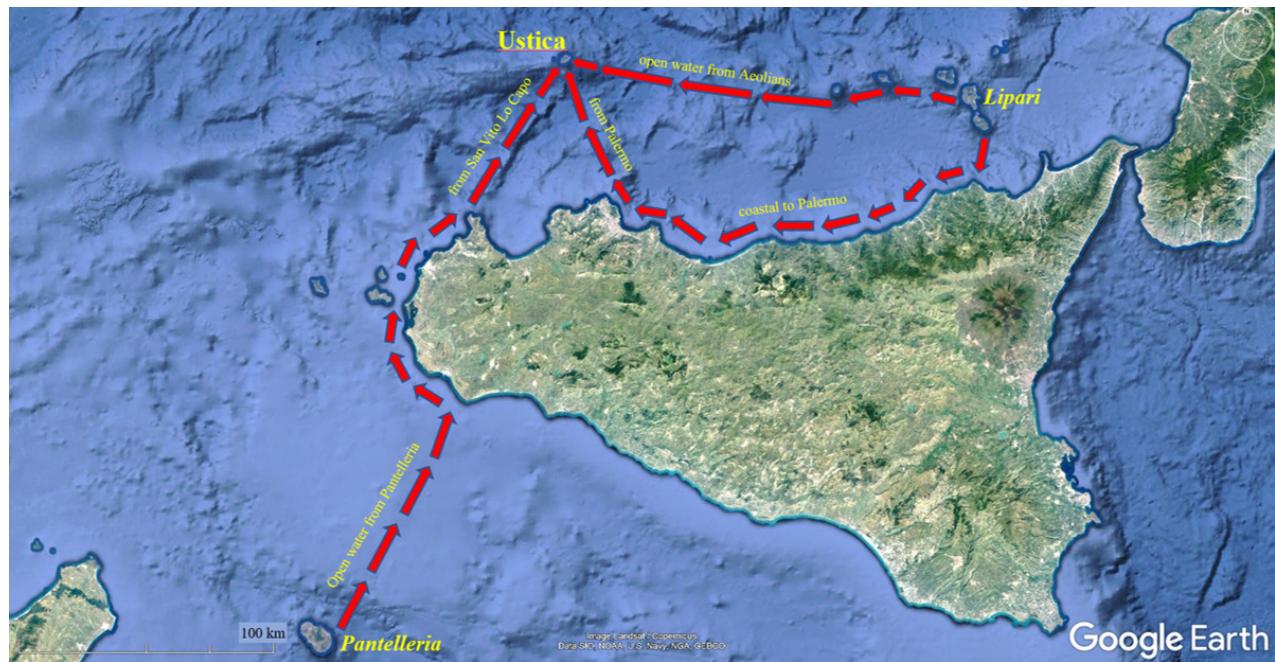
## 4 Discussion

The proportion of Lipari to Pantelleria obsidian reflects many potential variables which must be taken into account when comparing data between sites. The actual obsidian artifact may be a complete tool (e.g. a blade), or a broken/fragmented one, or a flake or piece ofdebitage that was the byproduct of production. An assemblage ofdebitage in a single archaeological context likely came from the same core or set of cores. Prepared obsidian cores have been found at many sites in peninsular Italy, hundreds of kilometers from the island sources, and it is generally thought that this stage of initial production was done near the geological sources, while later stages of tool production were mostly done at the site of their usage, especially if a residential settlement. Lipari was a major source of the obsidian distributed throughout the central Mediterranean during the Neolithic and continuing through the Bronze Age in Sicily (Tykot, et al., 2013), with lithic specialists living on Lipari at sites including Contrada Diana (Martinelli, et al., 2019). During the Neolithic, preformed cores were regularly distributed from Lipari to eastern Sicily, with distinctively wide blades produced at the archaeological sites (Freund, et al., 2015). The context in which obsidian artifacts are found therefore is important when assessing the number which may have come from the same core. For the assemblages of obsidian from Ustica tested in this study, most are from surface collections and deposits, without specific contextual information other than associated ceramics in some cases. The much greater shininess of Lipari obsidian may also have been a factor in the initial collection of surface finds (Tykot, 2019).

Statistical comparison of the proportions of obsidian source usage from different archaeological sites depends not only on having substantial numerical counts, but also the issues discussed above regarding typology, production, and context. Care must be taken in our evaluations which involve potential cultural, economic, and technological changes over the approximately four-thousand-year time span when obsidian was in use on Ustica. For the Neolithic (6th–4th millennia BCE), societies in Sicily and around the Tyrrhenian Sea were mainly egalitarian, and it appears that the majority of open-water travel was kept as short as possible. The distribution of obsidian strongly suggests pathways along coastlines up and down the Tyrrhenian coast of peninsular Italy, and with connections between mainland central-northern Italy and the large islands of Corsica and Sardinia thru the Tuscan Archipelago of small islands. A similar travel plan appears to have been used in crossing the Adriatic Sea, between the Dalmatian islands of Croatia (including Palagruža) and the Gargano peninsula in southeastern Italy, involving domesticated animals, chert, and obsidian (Brown, et al., 2018; Tykot, 2018). During the Neolithic, it strongly appears that most long-distance travel involved multiple legs over land and sea, referred to as down-the-line exchange (Tykot, 2011). During the Copper Age (3rd millennium BCE) and Early Bronze Age (ca. 2200–1500 BCE), more complex socioeconomic developments involved more craft specialization, and most likely the frequency of maritime travel to and from Ustica. The absence of copper ore sources in Sicily, however, delayed the growing importance of metals in this region and the use of obsidian stone tools continued.

The distance between Pantelleria and Ustica is about 240 km, with the longest open-water travel ~100 km to near Mazara del Vallo in southwest Sicily, then along the west coast and thru the Egadi Islands, and 55 km open-water from Capo Gallo (coast north of Palermo) to Ustica (Figure 10). The distance between Lipari and Ustica is 157 km, with 104 km from Alicudi (westernmost of the Aeolian Islands). The total distance for obsidian coming from Pantelleria is 1.5 times that for obsidian coming directly from Lipari, while the greatest open-water part is about the same (~100 km) for each. This is slightly more than the distance from Sicily to Malta, well-known for its Neolithic occupation - and usage of obsidian from both Lipari and Pantelleria (Tykot, 2017a). Of course, the proportion of Lipari to Pantelleria obsidian found in Sicily and elsewhere was based on multiple factors including the physical properties of the lithics, the size and accessibility of the raw blocks, and the importance of other materials that were being exchanged along these routes.

At least during the Neolithic, it is argued that Lipari was occupied seasonally rather than year-round, with maritime travel during the summer when the seas were calm (Martinelli, et al., 2019; Robb & Farr, 2005), and the same may have been the case for Ustica. No evidence of Neolithic settlement has been found on Pantelleria, although obsidian from there was collected and distributed during that period, while there are no signs of travel between Sardinia (to the northwest) and Sicily, with Ustica in between. Throughout the central Mediterranean, however, there were clear changes over time in lithic technology and production (Vianello & Tykot, 2016; Freund, 2018), and in maritime transportation, so that by the Late Bronze Age there were large vessels traveling from the Aegean to Sicily and Sardinia, with Mycenaean wares and Cypriot copper found in Sardinia, and Sardinian ceramics found in Lipari (Ferrarese Ceruti, 1998) and on Crete at



**Figure 10:** Map of potential routes for obsidian reaching Ustica.

Kommos (Watrous, et al., 1998). The Middle Bronze Age site of I Faraglioni on Ustica was part of the broader Sicilian cultural group and may well have been a stop along the way.

For six of the eight sites in this study, which have >20 artifacts tested, the percentage of Pantelleria obsidian ranges from 0 to 22%, with an average of 12% (Table 1). There are several outliers: none of the 54 analyzed for Boschetto are from Pantelleria (0%), while at both Piano dei Cardoni Alto (26/134, 19.4%) and Tramontana Alta (24/109, 22%) were much higher percentages of Pantellerian obsidian. This high percentage was in all three surface collections from different properties in the Tramontana Alta area. Unfortunately, we have no chronological association for any of these surface collections. For the three sites with chronological information (Spalmatore – Neolithic; Piano dei Cardoni – Copper Age; I Faraglioni – Middle Bronze Age), there is no significant difference in the percentage of Pantelleria obsidian (10.3%, 8.3%, 11.3%, respectively).

One of our main research questions is the actual routes taken from the obsidian island sources to Ustica. As an island, and a very small one at that, the trip there was of significant distance over water and would have had limited long-distance visibility. If the shortest distances were used, then we would expect the proportion of Pantelleria to Lipari at sites on Ustica to be very similar to that for the contemporary port of origin in northwest Sicily. For the Early Neolithic site of Grotta dell'Uzzo, more than 150 obsidian artifacts were analyzed with Pantelleria accounting for 40% (Francaviglia & Piperno, 1987). In contrast, at Spalmatore, assigned to the Neolithic period, only 11% is from Pantelleria, suggesting more direct contact with Lipari. For the site of Valdesi, however, near Palermo and about 40 km east of Uzzo (but same distance from Ustica), only 17% of the 42 obsidian artifacts analyzed came from Pantelleria. These differences may be due to a combination of factors including the greater distance from Pantelleria, shorter distance to Lipari, and the actual coastal and land travel routes taken at that time.

The Palmarola find on Ustica (Foresta Martin, et al., 2017) is another example of down-the-line, long-distance distribution, where obsidian, while important for stone tools, was only part of the package of materials being transported to this island.

## 5 Conclusions

The apparent regularity of obsidian distribution from the far away islands of Lipari and Pantelleria to the remote island of Ustica, from the Neolithic through Bronze Age, is informative about prehistoric maritime transport in the central Mediterranean. Ustica was not a stop along the way to other places, and the great open-water distances involved infer the directional and transportation capabilities of, as well as risks taken by, these early people especially during the 6th thru 4th millennia BCE when the cultural societies involved were beginning the growth of complexity. The absence of Lipari-Canneto Dentro obsidian on Ustica, for all time periods, supports the hypothesis of core production by specialists on Lipari who used the major Gabellotto Gorge outcrops for external distribution. In contrast, the acquisition of obsidian from Pantelleria during the Neolithic, when it appears to not yet have been settled, would have been by visitors, with most obsidian coming from Balata dei Turchi but some also from Lago di Venere.

The trade or distribution of obsidian to Ustica was never the main purpose of any travel, but a minor portion of the cargo which included ceramics, domesticated plants and animals, and textiles and other organic materials not preserved. The presence of obsidian from both Lipari and Pantelleria strongly infers different open-water travel routes to Ustica, while future use-wear studies of both obsidian and other lithic artifacts may show some selection for specific purposes. Continuing excavations at Piano dei Cardoni will provide much more information about early lifeways on Ustica (see Speciale, et al., 2020, this volume).

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## Appendix I. Calibrated Elemental Analysis Data with Assigned Obsidian Sources and Subsources

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Boschetto	38199	USBOS1	Bruker 5g	12871	271	20	43	135	35	Lipari	Gabellotto
Boschetto	38200	USBOS2	Bruker 5g	18242	296	18	52	161	38	Lipari	Gabellotto
Boschetto	38201	USBOS3	Bruker 5g	12746	270	23	44	132	34	Lipari	Gabellotto
Boschetto	38202	USBOS4	Bruker 5g	17756	282	15	49	153	33	Lipari	Gabellotto
Boschetto	38203	USBOS5	Bruker 5g	12772	267	19	43	134	35	Lipari	Gabellotto
Boschetto	38204	USBOS6	Bruker 5g	12779	283	22	48	136	34	Lipari	Gabellotto
Boschetto	38205	USBOS7	Bruker 5g	12797	272	18	48	131	36	Lipari	Gabellotto
Boschetto	38206	USBOS8	Bruker 5g	14369	300	24	47	134	38	Lipari	Gabellotto
Boschetto	38207	USBOS9	Bruker 5g	12005	263	19	44	127	35	Lipari	Gabellotto
Boschetto	38208	USBOS10	Bruker 5g	11713	259	18	46	127	34	Lipari	Gabellotto
Boschetto	38209	USBOS11	Bruker 5g	14142	282	21	45	140	37	Lipari	Gabellotto
Boschetto	38210	USBOS12	Bruker 5g	13126	291	26	48	139	34	Lipari	Gabellotto
Boschetto	38211	USBOS13	Bruker 5g	12567	277	20	49	133	34	Lipari	Gabellotto
Boschetto	38212	USBOS14	Bruker 5g	12427	276	18	42	132	33	Lipari	Gabellotto
Boschetto	38213	USBOS15	Bruker 5g	13741	276	20	43	138	35	Lipari	Gabellotto
Boschetto	38214	USBOS16	Bruker 5g	12674	275	20	40	135	33	Lipari	Gabellotto
Boschetto	38215	USBOS17	Bruker 5g	15032	304	24	47	142	37	Lipari	Gabellotto
Boschetto	38216	USBOS18	Bruker 5g	13042	285	22	48	135	34	Lipari	Gabellotto
Boschetto	38217	USBOS19	Bruker 5g	12421	277	19	37	131	39	Lipari	Gabellotto
Boschetto	38218	USBOS20	Bruker 5g	15576	299	20	51	139	36	Lipari	Gabellotto
Boschetto	38219	USBOS21	Bruker 5g	11506	258	18	40	129	33	Lipari	Gabellotto
Boschetto	38220	USBOS22	Bruker 5g	12441	267	20	45	147	36	Lipari	Gabellotto
Boschetto	38221	USBOS23	Bruker 5g	14129	299	20	43	145	41	Lipari	Gabellotto
Boschetto	38222	USBOS24	Bruker 5g	13548	289	25	48	141	33	Lipari	Gabellotto
Boschetto	38223	USBOS25	Bruker 5g	9783	223	16	42	118	28	Lipari	Gabellotto
Boschetto	38224	USBOS26	Bruker 5g	14781	304	21	46	144	39	Lipari	Gabellotto
Boschetto	38225	USBOS27	Bruker 5g	12106	277	16	45	155	35	Lipari	Gabellotto
Boschetto	38226	USBOS28	Bruker 5g	12202	277	14	44	151	35	Lipari	Gabellotto
Boschetto	38227	USBOS29	Bruker 5g	12494	308	16	49	159	39	Lipari	Gabellotto
Boschetto	38228	USBOS30	Bruker 5g	12296	290	14	46	149	36	Lipari	Gabellotto
Boschetto	38229	USBOS31	Bruker 5g	11674	271	16	42	136	30	Lipari	Gabellotto
Boschetto	38230	USBOS32	Bruker 5g	12021	287	15	45	137	33	Lipari	Gabellotto
Boschetto	38231	USBOS33	Bruker 5g	13726	307	14	51	160	36	Lipari	Gabellotto
Boschetto	38232	USBOS34	Bruker 5g	11930	276	16	42	129	31	Lipari	Gabellotto
Boschetto	38233	USBOS35	Bruker 5g	12246	290	20	44	134	36	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Boschetto	38234	USBOS36	Bruker 5g	13159	296	18	41	137	33	Lipari	Gabellotto
Boschetto	38235	USBOS37	Bruker 5g	14492	304	15	47	144	36	Lipari	Gabellotto
Boschetto	38236	USBOS38	Bruker 5g	13334	292	15	44	136	37	Lipari	Gabellotto
Boschetto	38237	USBOS39	Bruker 5g	12707	290	17	43	153	36	Lipari	Gabellotto
Boschetto	38238	USBOS40	Bruker 5g	13704	311	21	50	140	37	Lipari	Gabellotto
Boschetto	38239	USBOS41	Bruker 5g	12644	279	16	47	130	34	Lipari	Gabellotto
Boschetto	38240	USBOS42	Bruker 5g	13479	313	17	50	140	37	Lipari	Gabellotto
Boschetto	38241	USBOS43	Bruker 5g	14251	316	19	50	164	34	Lipari	Gabellotto
Boschetto	38242	USBOS44	Bruker 5g	13643	307	18	50	154	36	Lipari	Gabellotto
Boschetto	38243	USBOS45	Bruker 5g	12836	297	16	47	140	37	Lipari	Gabellotto
Boschetto	38244	USBOS46	Bruker 5g	12614	291	16	45	133	35	Lipari	Gabellotto
Boschetto	38245	USBOS47	Bruker 5g	11818	273	18	38	134	36	Lipari	Gabellotto
Boschetto	38246	USBOS48	Bruker 5g	11580	273	16	41	132	32	Lipari	Gabellotto
Boschetto	38247	USBOS49	Bruker 5g	13834	310	18	46	165	37	Lipari	Gabellotto
Boschetto	38248	USBOS50	Bruker 5g	12855	304	13	41	134	36	Lipari	Gabellotto
Boschetto	38249	USBOS51	Bruker 5g	13474	292	15	46	152	38	Lipari	Gabellotto
Boschetto	38250	USBOS52	Bruker 5g	12934	304	21	44	135	42	Lipari	Gabellotto
Boschetto	38251	USBOS53	Bruker 5g	14035	301	20	50	150	38	Lipari	Gabellotto
Boschetto	38252	USBOS54	Bruker 5g	12824	294	15	46	133	31	Lipari	Gabellotto
Culunnella	28925	Ustica 283	Bruker III-SD	12055	285	21	41	164	37	Lipari	Gabellotto
Culunnella	28926	Ustica 284	Bruker III-SD	11982	294	18	42	165	35	Lipari	Gabellotto
Culunnella	28927	Ustica 285	Bruker III-SD	12279	285	20	50	173	33	Lipari	Gabellotto
Culunnella	31524		Bruker 5i	12027	286	15	48	157	33	Lipari	Gabellotto
C.G. Seminara	27248	227	Bruker III-SD	12522	304	19	43	175	36	Lipari	Gabellotto
C.G. Seminara	27249	228	Bruker III-SD	11533	277	18	42	171	35	Lipari	Gabellotto
C.G. Seminara	27250	229	Bruker III-SD	54359	169	11	167	1637	374	Pantelleria	Balata dei Turchi
C.G. Seminara	27251	230	Bruker III-SD	11289	284	16	44	176	37	Lipari	Gabellotto
C.G. Seminara	27252	231	Bruker III-SD	11946	298	21	50	175	39	Lipari	Gabellotto
C.G. Seminara	27253	232	Bruker III-SD	11936	310	18	42	167	34	Lipari	Gabellotto
C.G. Seminara	27254	233	Bruker III-SD	11766	283	22	47	174	37	Lipari	Gabellotto
C.G. Seminara	27255	234	Bruker III-SD	14030	292	19	46	180	38	Lipari	Gabellotto
C.G. Seminara	27256	235	Bruker III-SD	12137	297	19	48	180	38	Lipari	Gabellotto
C.G. Seminara	27257	236	Bruker III-SD	11728	286	19	43	170	36	Lipari	Gabellotto
C.G. Seminara	27258	237	Bruker III-SD	55561	183	14	173	1684	382	Pantelleria	Balata dei Turchi
C.G. Seminara	27259	238	Bruker III-SD	11787	292	19	42	173	38	Lipari	Gabellotto
C.G. Seminara	27260	239	Bruker III-SD	11803	293	20	43	179	36	Lipari	Gabellotto
C.G. Seminara	27261	240	Bruker III-SD	11270	279	18	39	170	37	Lipari	Gabellotto
C.G. Seminara	27262	241	Bruker III-SD	57009	180	12	171	1623	351	Pantelleria	Balata dei Turchi

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
C.G. Seminara	27263	242	Bruker III-SD	11921	283	19	40	162	34	Lipari	Gabellotto
C.G. Seminara	27264	243	Bruker III-SD	11838	293	19	46	173	33	Lipari	Gabellotto
C.G. Seminara	27265	244	Bruker III-SD	11489	284	16	42	174	36	Lipari	Gabellotto
C.G. Seminara	27266	245	Bruker III-SD	54813	175	14	167	1597	354	Pantelleria	Balata dei Turchi
C.G. Seminara	27267	246	Bruker III-SD	11769	304	20	42	162	33	Lipari	Gabellotto
C.G. Seminara	27268	247	Bruker III-SD	11445	300	21	41	173	36	Lipari	Gabellotto
C.G. Seminara	27269	248	Bruker III-SD	12942	308	21	42	178	40	Lipari	Gabellotto
C.G. Seminara	27270	249	Bruker III-SD	12136	299	17	45	174	36	Lipari	Gabellotto
C.G. Seminara	27271	250	Bruker III-SD	13446	292	22	47	166	37	Lipari	Gabellotto
C.G. Seminara	27272	251	Bruker III-SD	12787	291	18	45	172	34	Lipari	Gabellotto
C.G. Seminara	27273	252	Bruker III-SD	12228	300	21	45	178	36	Lipari	Gabellotto
C.G. Seminara	27274	253	Bruker III-SD	12316	315	18	50	207	35	Lipari	Gabellotto
C.G. Seminara	27275	254	Bruker III-SD	12097	283	18	43	170	34	Lipari	Gabellotto
C.G. Seminara	27276	255	Bruker III-SD	57210	185	14	181	1710	369	Pantelleria	Balata dei Turchi
C.G. Seminara	27277	256	Bruker III-SD	13088	313	18	43	180	40	Lipari	Gabellotto
C.G. Seminara	27278	257	Bruker III-SD	11749	268	19	46	171	35	Lipari	Gabellotto
C.G. Seminara	27279	258	Bruker III-SD	13183	321	19	41	184	39	Lipari	Gabellotto
C.G. Seminara	27280	259	Bruker III-SD	13778	322	22	45	183	40	Lipari	Gabellotto
C.G. Seminara	27281	260	Bruker III-SD	10586	284	20	45	167	38	Lipari	Gabellotto
C.G. Seminara	27282	261	Bruker III-SD	12312	258	19	40	159	35	Lipari	Gabellotto
C.G. Seminara	27283	262	Bruker III-SD	55093	186	12	185	1647	370	Pantelleria	Balata dei Turchi
C.G. Seminara	27284	263	Bruker III-SD	12384	285	20	44	168	34	Lipari	Gabellotto
C.G. Seminara	27285	264	Bruker III-SD	12399	304	21	50	185	40	Lipari	Gabellotto
C.G. Seminara	27286	265	Bruker III-SD	11436	281	23	41	171	37	Lipari	Gabellotto
C.G. Seminara	27287	266	Bruker III-SD	11580	276	18	46	165	34	Lipari	Gabellotto
C.G. Seminara	27288	267	Bruker III-SD	11887	276	21	42	166	37	Lipari	Gabellotto
C.G. Seminara	27289	268	Bruker III-SD	52933	181	11	167	1638	371	Pantelleria	Balata dei Turchi
C.G. Seminara	27290	269	Bruker III-SD	13552	301	22	47	176	34	Lipari	Gabellotto
C.G. Seminara	27291	270	Bruker III-SD	11797	292	19	43	178	37	Lipari	Gabellotto
C.G. Seminara	27292	271	Bruker III-SD	11795	301	20	40	170	38	Lipari	Gabellotto
C.G. Seminara	27293	272	Bruker III-SD	12903	305	17	46	177	36	Lipari	Gabellotto
C.G. Seminara	27294	273	Bruker III-SD	57570	199	12	177	1712	375	Pantelleria	Balata dei Turchi
C.G. Seminara	27295	274	Bruker III-SD	11191	285	15	44	164	35	Lipari	Gabellotto
C.G. Seminara	27296	275	Bruker III-SD	11664	296	20	40	174	39	Lipari	Gabellotto
C.G. Seminara	27297	276	Bruker III-SD	11527	278	19	38	165	37	Lipari	Gabellotto
C.G. Seminara	27298	277	Bruker III-SD								not obsid.
C.G. Seminara	27299	278	Bruker III-SD	12164	275	19	47	190	34	Lipari	Gabellotto
C.G. Seminara	27300	279	Bruker III-SD	55652	178	15	171	1637	379	Pantelleria	Balata dei Turchi

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
C.G. Seminara	27301	280	Bruker III-SD	12489	311	19	44	178	38	Lipari	Gabellotto
C.G. Seminara	27302	281	Bruker III-SD	13325	288	21	49	175	36	Lipari	Gabellotto
C.G. Seminara	27303	282	Bruker III-SD	12482	297	20	45	181	36	Lipari	Gabellotto
C.G. Seminara	27304	283	Bruker III-SD	12814	285	19	43	172	35	Lipari	Gabellotto
C.G. Seminara	27305	284	Bruker III-SD	12522	308	22	43	176	41	Lipari	Gabellotto
C.G. Seminara	27306	285	Bruker III-SD	14071	336	22	45	202	42	Lipari	Gabellotto
C.G. Seminara	27307	286	Bruker III-SD	57124	189	9	181	1685	380	Pantelleria	Balata dei Turchi
C.G. Seminara	27308	287	Bruker III-SD	11312	283	17	44	172	38	Lipari	Gabellotto
C.G. Seminara	27309	288	Bruker III-SD	12711	286	18	45	179	36	Lipari	Gabellotto
C.G. Seminara	27310	289	Bruker III-SD	11551	269	16	42	160	35	Lipari	Gabellotto
C.G. Seminara	27311	290	Bruker III-SD	11802	283	19	45	173	34	Lipari	Gabellotto
C.G. Seminara	27312	291	Bruker III-SD	12338	262	33	39	157	36	Lipari	Gabellotto North
C.G. Seminara	27313	292	Bruker III-SD	55582	177	10	173	1673	376	Pantelleria	Balata dei Turchi
C.G. Seminara	27314	293	Bruker III-SD	11620	297	20	39	172	39	Lipari	Gabellotto
C.G. Seminara	27315	294	Bruker III-SD	11369	281	18	43	169	37	Lipari	Gabellotto
C.G. Seminara	27316	295	Bruker III-SD	12119	286	18	42	172	36	Lipari	Gabellotto
C.G. Seminara	27317	296	Bruker III-SD	12085	277	22	44	171	35	Lipari	Gabellotto
C.G. Seminara	27318	297	Bruker III-SD	56682	182	12	183	1688	376	Pantelleria	Balata dei Turchi
C.G. Seminara	27319	298	Bruker III-SD	11194	274	18	38	167	32	Lipari	Gabellotto
C.G. Seminara	27320	299	Bruker III-SD	54640	174	14	172	1603	360	Pantelleria	Balata dei Turchi
C.G. Seminara	27321	300	Bruker III-SD	12477	308	20	44	181	39	Lipari	Gabellotto
C.G. Seminara	27322	301	Bruker III-SD	10868	281	18	36	166	29	Lipari	Gabellotto
C.G. Seminara	27323	302	Bruker III-SD	12124	301	19	46	176	38	Lipari	Gabellotto
C.G. Seminara	27324	303	Bruker III-SD	12060	288	20	38	166	34	Lipari	Gabellotto
C.G. Seminara	27325	304	Bruker III-SD	11986	287	17	44	170	35	Lipari	Gabellotto
C.G. Seminara	27326	305	Bruker III-SD	13623	303	21	42	184	40	Lipari	Gabellotto
C.G. Seminara	27327	306	Bruker III-SD	12275	294	22	40	211	39	Lipari	Gabellotto
C.G. Seminara	27328	307	Bruker III-SD	10651	268	16	40	164	29	Lipari	Gabellotto
C.G. Seminara	27329	308	Bruker III-SD	12724	319	19	42	184	38	Lipari	Gabellotto
C.G. Seminara	27330	309	Bruker III-SD	53397	171	17	171	1621	355	Pantelleria	Balata dei Turchi
C.G. Seminara	27331	310	Bruker III-SD	13308	275	20	38	171	34	Lipari	Gabellotto
C.G. Seminara	27332	311	Bruker III-SD	15918	272	34	44	174	37	Lipari	Gabellotto North
C.G. Seminara	27333	312	Bruker III-SD	14829	320	21	43	184	40	Lipari	Gabellotto
C.G. Seminara	27334	313	Bruker III-SD	12519	326	20	45	184	41	Lipari	Gabellotto
C.G. Seminara	27335	314	Bruker III-SD	12545	284	40	44	162	32	Lipari	Canneto Dentro
C.G. Seminara	27336	315	Bruker III-SD	12339	283	22	46	171	37	Lipari	Gabellotto
C.G. Seminara	27337	316	Bruker III-SD	11556	272	18	37	159	34	Lipari	Gabellotto
C.G. Seminara	27338	317	Bruker III-SD	11421	291	21	41	173	36	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
C.G. Seminara	27339	318	Bruker III-SD							not obsid.	
C.G. Seminara	27340	319	Bruker III-SD	12050	310	18	42	174	38	Lipari	Gabellotto
C.G. Seminara	27341	320	Bruker III-SD	12775	294	21	41	173	34	Lipari	Gabellotto
C.G. Seminara	27342	321	Bruker III-SD	11998	299	20	44	171	38	Lipari	Gabellotto
C.G. Seminara	27343	322	Bruker III-SD	57286	180	12	182	1687	372	Pantelleria	Balata dei Turchi
C.G. Seminara	27344	323	Bruker III-SD	13523	314	19	44	176	37	Lipari	Gabellotto
C.G. Seminara	27345	324	Bruker III-SD	12007	266	18	43	180	35	Lipari	Gabellotto
C.G. Seminara	27346	325	Bruker III-SD	13168	299	23	40	170	38	Lipari	Gabellotto
C.G. Seminara	27347	326	Bruker III-SD	12027	296	19	43	172	35	Lipari	Gabellotto
C.G. Seminara	27348	327	Bruker III-SD	12133	297	20	43	177	38	Lipari	Gabellotto
C.G. Seminara	27349	328	Bruker III-SD	14723	283	19	43	171	32	Lipari	Gabellotto
C.G. Seminara	27350	329	Bruker III-SD	14225	307	20	42	179	38	Lipari	Gabellotto
C.G. Seminara	27351	330	Bruker III-SD	11771	302	21	44	174	37	Lipari	Gabellotto
C.G. Seminara	27352	331	Bruker III-SD	11236	260	20	35	159	34	Lipari	Gabellotto
C.G. Seminara	27353	332	Bruker III-SD	12212	291	21	45	180	37	Lipari	Gabellotto
C.G. Seminara	27354	333	Bruker III-SD	12090	279	18	40	168	35	Lipari	Gabellotto
C.G. Seminara	27355	334	Bruker III-SD	53450	173	13	162	1569	354	Pantelleria	Balata dei Turchi
C.G. Seminara	27356	335	Bruker III-SD	12685	276	24	37	170	32	Lipari	Gabellotto
C.G. Seminara	27357	336	Bruker III-SD	12262	286	20	46	168	36	Lipari	Gabellotto
C.G. Seminara	27358	337	Bruker III-SD	11823	304	21	41	171	37	Lipari	Gabellotto
C.G. Seminara	27359	338	Bruker III-SD	10842	272	17	39	164	36	Lipari	Gabellotto
C.G. Seminara	27360	339	Bruker III-SD	11376	268	14	38	162	34	Lipari	Gabellotto
C.G. Seminara	27361	340	Bruker III-SD	11701	279	16	48	170	37	Lipari	Gabellotto
C.G. Seminara	27362	341	Bruker III-SD	11953	288	19	49	174	35	Lipari	Gabellotto
C.G. Seminara	27363	342	Bruker III-SD	12079	300	21	46	170	35	Lipari	Gabellotto
C.G. Seminara	27364	343	Bruker III-SD	12152	300	22	49	179	38	Lipari	Gabellotto
C.G. Seminara	27365	344	Bruker III-SD	11050	273	17	45	176	37	Lipari	Gabellotto
C.G. Seminara	27366	345	Bruker III-SD	53078	171	15	174	1624	356	Pantelleria	Balata dei Turchi
C.G. Seminara	27367	346	Bruker III-SD	11608	289	20	46	179	39	Lipari	Gabellotto
C.G. Seminara	27368	347	Bruker III-SD	12244	312	20	44	187	41	Lipari	Gabellotto
C.G. Seminara	27369	348	Bruker III-SD	12310	303	19	39	180	39	Lipari	Gabellotto
C.G. Seminara	27370	349	Bruker III-SD	13128	312	18	41	179	37	Lipari	Gabellotto
C.G. Seminara	27371	350	Bruker III-SD	11819	293	19	48	170	34	Lipari	Gabellotto
C.G. Seminara	27372	351	Bruker III-SD	55692	176	17	182	1653	364	Pantelleria	Balata dei Turchi
C.G. Seminara	27373	352	Bruker III-SD	12296	302	20	42	172	34	Lipari	Gabellotto
C.G. Seminara	27374	353	Bruker III-SD	11954	289	21	46	171	38	Lipari	Gabellotto
C.G. Seminara	27375	354	Bruker III-SD	11569	286	20	45	172	36	Lipari	Gabellotto
C.G. Seminara	27376	355	Bruker III-SD	53189	176	14	164	1613	345	Pantelleria	Balata dei Turchi

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
C.G. Seminara	27377	356	Bruker III-SD	11361	283	17	46	173	39	Lipari	Gabellotto
C.G. Seminara	27378	357	Bruker III-SD	11872	293	16	51	180	35	Lipari	Gabellotto
I Faraglioni	21273		Bruker III-SD	11731	305	17	43	168	37	Lipari	Gabellotto
I Faraglioni	21274		Bruker III-SD	12858	269	18	41	160	35	Lipari	Gabellotto
I Faraglioni	21275		Bruker III-SD	11944	294	22	51	169	34	Lipari	Gabellotto
I Faraglioni	21276		Bruker III-SD	14585	305	20	45	175	36	Lipari	Gabellotto
I Faraglioni	21277		Bruker III-SD	13167	282	19	44	181	37	Lipari	Gabellotto
I Faraglioni	21278		Bruker III-SD	13543	289	19	40	176	39	Lipari	Gabellotto
I Faraglioni	21279		Bruker III-SD	14153	284	23	44	167	34	Lipari	Gabellotto
I Faraglioni	28651	Ustica 9	Bruker III-SD	54594	177	13	182	1637	368	Pantelleria	Balata dei Turchi
I Faraglioni	28652	Ustica 10	Bruker III-SD	11742	285	21	44	165	32	Lipari	Gabellotto
I Faraglioni	28653	Ustica 11	Bruker III-SD	11471	306	16	46	173	35	Lipari	Gabellotto
I Faraglioni	28654	Ustica 12	Bruker III-SD	11076	286	16	45	167	37	Lipari	Gabellotto
I Faraglioni	28683	Ustica 41	Bruker III-SD	55428	172	17	188	1669	384	Pantelleria	Balata dei Turchi
I Faraglioni	28684	Ustica 42	Bruker III-SD	11499	280	22	45	195	32	Lipari	Gabellotto
I Faraglioni	28685	Ustica 43	Bruker III-SD	20934	163	17	35	727	199	Pantelleria	Lago di Venere 2
I Faraglioni	28686	Ustica 44	Bruker III-SD	13682	283	20	44	175	33	Lipari	Gabellotto
I Faraglioni	28687	Ustica 45	Bruker III-SD	55915	180	12	183	1686	364	Pantelleria	Balata dei Turchi
I Faraglioni	28721	Ustica 79	Bruker III-SD	10746	272	19	39	173	37	Lipari	Gabellotto
I Faraglioni	28722	Ustica 80	Bruker III-SD	11878	288	17	39	172	34	Lipari	Gabellotto
I Faraglioni	28723	Ustica 81	Bruker III-SD	11560	280	19	41	167	38	Lipari	Gabellotto
I Faraglioni	28724	Ustica 82	Bruker III-SD	11183	276	18	45	172	34	Lipari	Gabellotto
I Faraglioni	28725	Ustica 83	Bruker III-SD	55141	178	14	169	1590	354	Pantelleria	Balata dei Turchi
I Faraglioni	28726	Ustica 84	Bruker III-SD	11732	289	17	47	175	35	Lipari	Gabellotto
I Faraglioni	28727	Ustica 85	Bruker III-SD	58639	191	9	182	1728	390	Pantelleria	Balata dei Turchi
I Faraglioni	28728	Ustica 86	Bruker III-SD	12461	307	18	44	177	38	Lipari	Gabellotto
I Faraglioni	28729	Ustica 87	Bruker III-SD	13441	300	19	40	179	36	Lipari	Gabellotto
I Faraglioni	28730	Ustica 88	Bruker III-SD	57688	189	11	176	1664	354	Pantelleria	Balata dei Turchi
I Faraglioni	28731	Ustica 89	Bruker III-SD	15177	318	21	49	183	36	Lipari	Gabellotto
I Faraglioni	28732	Ustica 90	Bruker III-SD	14130	330	14	44	180	39	Lipari	Gabellotto
I Faraglioni	28910	Ustica 268	Bruker III-SD	11324	276	18	39	164	36	Lipari	Gabellotto
I Faraglioni	28911	Ustica 269	Bruker III-SD	55373	184	12	174	1662	363	Pantelleria	Balata dei Turchi
I Faraglioni	28912	Ustica 270	Bruker III-SD	13289	317	17	39	192	35	Lipari	Gabellotto
I Faraglioni	28913	Ustica 271	Bruker III-SD	12206	287	16	44	189	36	Lipari	Gabellotto
I Faraglioni	28914	Ustica 272	Bruker III-SD	12809	334	17	38	180	44	Lipari	Gabellotto
I Faraglioni	28915	Ustica 273	Bruker III-SD	13395	325	18	45	177	39	Lipari	Gabellotto
I Faraglioni	28916	Ustica 274	Bruker III-SD	11559	295	21	43	162	41	Lipari	Gabellotto
I Faraglioni	28917	Ustica 275	Bruker III-SD	12332	310	22	43	180	37	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
I Faraglioni	28918	Ustica 276	Bruker III-SD	13058	313	18	48	184	38	Lipari	Gabellotto
I Faraglioni	28919	Ustica 277	Bruker III-SD	12601	298	16	43	179	33	Lipari	Gabellotto
I Faraglioni	28920	Ustica 278	Bruker III-SD	12683	289	19	46	172	39	Lipari	Gabellotto
I Faraglioni	28921	Ustica 279	Bruker III-SD	11308	272	18	43	165	32	Lipari	Gabellotto
I Faraglioni	28922	Ustica 280	Bruker III-SD	11663	293	18	41	178	34	Lipari	Gabellotto
I Faraglioni	28923	Ustica 281	Bruker III-SD	11843	293	21	40	180	37	Lipari	Gabellotto
I Faraglioni	28924	Ustica 282	Bruker III-SD	12990	315	15	45	173	38	Lipari	Gabellotto
I Faraglioni	28928	Ustica 286	Bruker III-SD	12409	279	19	43	163	36	Lipari	Gabellotto
I Faraglioni	28929	Ustica 287	Bruker III-SD	12060	311	23	42	177	35	Lipari	Gabellotto
I Faraglioni	28930	Ustica 288	Bruker III-SD	14796	378	24	42	199	44	Lipari	Gabellotto
I Faraglioni	28931	Ustica 289	Bruker III-SD	13727	326	16	44	183	42	Lipari	Gabellotto
I Faraglioni	28932	Ustica 290	Bruker III-SD	12330	308	18	36	182	42	Lipari	Gabellotto
I Faraglioni	28933	Ustica 291	Bruker III-SD	21331	159	17	38	707	203	Pantelleria	Lago di Venere 2
I Faraglioni	28934	Ustica 292	Bruker III-SD	52381	172	13	155	1550	350	Pantelleria	Balata dei Turchi
I Faraglioni	28935	Ustica 293	Bruker III-SD	55733	186	19	157	1625	369	Pantelleria	Balata dei Turchi
I Faraglioni	28936	Ustica 294	Bruker III-SD	55238	182	12	176	1718	370	Pantelleria	Balata dei Turchi
I Faraglioni	28937	Ustica 295	Bruker III-SD	21646	132	15	39	635	187	Pantelleria	Lago di Venere 2
I Faraglioni	28938	Ustica 296	Bruker III-SD	54122	181	11	159	1565	355	Pantelleria	Balata dei Turchi
I Faraglioni	28939	Ustica 297	Bruker III-SD	58390	195	11	180	1676	355	Pantelleria	Balata dei Turchi
I Faraglioni	28940	Ustica 298	Bruker III-SD	11109	272	19	43	171	32	Lipari	Gabellotto
I Faraglioni	28941	Ustica 299	Bruker III-SD	12775	302	18	48	175	36	Lipari	Gabellotto
I Faraglioni	28942	Ustica 300	Bruker III-SD	13142	259	20	36	166	33	Lipari	Gabellotto
I Faraglioni	28943	Ustica 301	Bruker III-SD	15872	340	26	42	182	43	Lipari	Gabellotto
I Faraglioni	28944	Ustica 302	Bruker III-SD	15531	373	22	50	185	42	Lipari	Gabellotto
I Faraglioni	28945	Ustica 303	Bruker III-SD	12394	307	19	44	180	34	Lipari	Gabellotto
I Faraglioni	28946	Ustica 304	Bruker III-SD	11907	291	16	38	166	36	Lipari	Gabellotto
I Faraglioni	28947	Ustica 305	Bruker III-SD	11573	295	22	46	178	36	Lipari	Gabellotto
I Faraglioni	28948	Ustica 306	Bruker III-SD	13148	298	17	39	179	34	Lipari	Gabellotto
I Faraglioni	28949	Ustica 307	Bruker III-SD	14365	330	21	46	186	40	Lipari	Gabellotto
I Faraglioni	28950	Ustica 308	Bruker III-SD	14894	355	14	50	176	44	Lipari	Gabellotto
I Faraglioni	28951	Ustica 309	Bruker III-SD	12633	308	22	40	217	36	Lipari	Gabellotto
I Faraglioni	28952	Ustica 310	Bruker III-SD	15483	322	23	46	185	36	Lipari	Gabellotto
I Faraglioni	28953	Ustica 311	Bruker III-SD	13012	312	22	40	176	37	Lipari	Gabellotto
I Faraglioni	28954	Ustica 312	Bruker III-SD	10806	279	20	42	164	42	Lipari	Gabellotto
I Faraglioni	28955	Ustica 313	Bruker III-SD	11701	272	15	36	172	31	Lipari	Gabellotto
I Faraglioni	28956	Ustica 314	Bruker III-SD	11928	295	18	39	171	32	Lipari	Gabellotto
I Faraglioni	28957	Ustica 315	Bruker III-SD	11198	291	17	39	161	32	Lipari	Gabellotto
I Faraglioni	28958	Ustica 316	Bruker III-SD	10617	277	16	38	172	32	Lipari	Gabellotto

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I Faraglioni	28959	Ustica 317	Bruker III-SD	11221	263	21	48	160	37	Lipari	Gabellotto
I Faraglioni	28960	Ustica 318	Bruker III-SD	13039	309	15	42	177	39	Lipari	Gabellotto
I Faraglioni	28961	Ustica 319	Bruker III-SD	11932	292	19	43	179	40	Lipari	Gabellotto
I Faraglioni	28962	Ustica 320	Bruker III-SD	12078	299	18	45	164	37	Lipari	Gabellotto
I Faraglioni	28963	Ustica 321	Bruker III-SD	11804	281	20	45	173	38	Lipari	Gabellotto
I Faraglioni	28964	Ustica 322	Bruker III-SD	14060	323	18	49	186	34	Lipari	Gabellotto
I Faraglioni	28965	Ustica 323	Bruker III-SD	12225	298	22	42	177	36	Lipari	Gabellotto
I Faraglioni	28966	Ustica 324	Bruker III-SD	13333	324	18	41	196	38	Lipari	Gabellotto
I Faraglioni	28967	Ustica 325	Bruker III-SD	11800	287	19	46	166	37	Lipari	Gabellotto
I Faraglioni	28968	Ustica 326	Bruker III-SD	13328	303	22	53	192	39	Lipari	Gabellotto
I Faraglioni	28969	Ustica 327	Bruker III-SD							not obsid.	
I Faraglioni	28970	Ustica 328	Bruker III-SD	12175	308	17	52	176	35	Lipari	Gabellotto
I Faraglioni	28971	Ustica 329	Bruker III-SD	13177	298	18	31	175	32	Lipari	Gabellotto
I Faraglioni	28972	Ustica 330	Bruker III-SD	13018	325	16	48	187	38	Lipari	Gabellotto
I Faraglioni	28973	Ustica 331	Bruker III-SD	13519	302	23	50	179	40	Lipari	Gabellotto
I Faraglioni	28974	Ustica 332	Bruker III-SD	11263	276	16	32	164	33	Lipari	Gabellotto
I Faraglioni	28975	Ustica 333	Bruker III-SD	15178	319	20	55	194	40	Lipari	Gabellotto
I Faraglioni	28976	Ustica 334	Bruker III-SD	13830	321	16	48	182	47	Lipari	Gabellotto
I Faraglioni	28977	Ustica 335	Bruker III-SD	13905	307	24	44	187	38	Lipari	Gabellotto
I Faraglioni	28978	Ustica 336	Bruker III-SD	56874	182	15	174	1676	371	Pantelleria	Balata dei Turchi
I Faraglioni	28979	Ustica 337	Bruker III-SD	12169	289	19	47	173	34	Lipari	Gabellotto
I Faraglioni	28980	Ustica 338	Bruker III-SD	11544	274	21	45	171	33	Lipari	Gabellotto
I Faraglioni	28981	Ustica 339	Bruker III-SD	53865	166	14	171	1578	366	Pantelleria	Balata dei Turchi
I Faraglioni	28982	Ustica 340	Bruker III-SD	12280	298	19	51	177	38	Lipari	Gabellotto
I Faraglioni	28983	Ustica 341	Bruker III-SD	12172	301	18	45	181	39	Lipari	Gabellotto
I Faraglioni	28984	Ustica 342	Bruker III-SD	11827	288	20	37	168	39	Lipari	Gabellotto
I Faraglioni	28985	Ustica 343	Bruker III-SD	11224	289	14	43	166	33	Lipari	Gabellotto
I Faraglioni	28986	Ustica 344	Bruker III-SD	11369	271	22	48	168	31	Lipari	Gabellotto
I Faraglioni	28987	Ustica 345	Bruker III-SD	12747	307	21	41	183	36	Lipari	Gabellotto
I Faraglioni	28988	Ustica 346	Bruker III-SD	12851	298	30	44	187	34	Lipari	Gabellotto
I Faraglioni	28989	Ustica 347	Bruker III-SD	12146	294	17	46	185	35	Lipari	Gabellotto
I Faraglioni	28990	Ustica 348	Bruker III-SD	12982	312	19	50	187	36	Lipari	Gabellotto
I Faraglioni	28991	Ustica 349	Bruker III-SD	12459	293	20	41	176	38	Lipari	Gabellotto
I Faraglioni	28992	Ustica 350	Bruker III-SD	11465	263	18	49	162	33	Lipari	Gabellotto
I Faraglioni	28993	Ustica 351	Bruker III-SD	11434	273	18	46	170	32	Lipari	Gabellotto
I Faraglioni	28994	Ustica 352	Bruker III-SD	11808	296	22	44	172	32	Lipari	Gabellotto
I Faraglioni	28995	Ustica 353	Bruker III-SD	12133	309	20	42	179	35	Lipari	Gabellotto
I Faraglioni	28996	Ustica 354	Bruker III-SD	12317	278	19	41	173	36	Lipari	Gabellotto

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I Faraglioni	28997	Ustica 355	Bruker III-SD	10713	268	12	45	172	38	Lipari	Gabellotto
I Faraglioni	28998	Ustica 356	Bruker III-SD	12532	293	19	56	182	36	Lipari	Gabellotto
I Faraglioni	28999	Ustica 357	Bruker III-SD	11511	283	19	46	172	34	Lipari	Gabellotto
I Faraglioni	29000	Ustica 358	Bruker III-SD	16716	335	20	37	193	44	Lipari	Gabellotto
I Faraglioni	29001	Ustica 359	Bruker III-SD	53790	180	14	171	1580	353	Pantelleria	Balata dei Turchi
I Faraglioni	29002	Ustica 360	Bruker III-SD	11030	278	19	43	167	36	Lipari	Gabellotto
I Faraglioni	29003	Ustica 361	Bruker III-SD	11896	270	21	44	167	35	Lipari	Gabellotto
I Faraglioni	29004	Ustica 362	Bruker III-SD	12243	309	19	45	190	33	Lipari	Gabellotto
I Faraglioni	29005	Ustica 363	Bruker III-SD	11410	269	17	40	173	38	Lipari	Gabellotto
I Faraglioni	29006	Ustica 364	Bruker III-SD	12604	272	23	46	171	37	Lipari	Gabellotto
I Faraglioni	29007	Ustica 365	Bruker III-SD	56409	212	19	166	1764	392	Pantelleria	Balata dei Turchi
I Faraglioni	29008	Ustica 366	Bruker III-SD	10911	290	26	39	170	36	Lipari	Gabellotto
I Faraglioni	29009	Ustica 367	Bruker III-SD	14961	351	22	46	194	40	Lipari	Gabellotto
I Faraglioni	29010	Ustica 368	Bruker III-SD	13845	323	21	52	189	36	Lipari	Gabellotto
I Faraglioni	29011	Ustica 369	Bruker III-SD	16624	346	25	56	214	48	Lipari	Gabellotto
I Faraglioni	29012	Ustica 370	Bruker III-SD	12726	283	16	51	165	37	Lipari	Gabellotto
I Faraglioni	29013	Ustica 371	Bruker III-SD	16035	323	25	50	200	42	Lipari	Gabellotto
I Faraglioni	29014	Ustica 372	Bruker III-SD	15511	365	20	48	219	39	Lipari	Gabellotto
I Faraglioni	29015	Ustica 373	Bruker III-SD	13622	325	19	42	175	39	Lipari	Gabellotto
I Faraglioni	29016	Ustica 374	Bruker III-SD	14265	269	20	42	140	25	Lipari	Gabellotto
I Faraglioni	29017	Ustica 375	Bruker III-SD	11674	302	14	40	166	34	Lipari	Gabellotto
I Faraglioni	29018	Ustica 376	Bruker III-SD	11979	285	17	46	180	35	Lipari	Gabellotto
I Faraglioni	29019	Ustica 377	Bruker III-SD	14015	300	15	42	181	32	Lipari	Gabellotto
I Faraglioni	29020	Ustica 378	Bruker III-SD	12674	326	25	42	187	38	Lipari	Gabellotto
I Faraglioni	29021	Ustica 379	Bruker III-SD	12409	302	17	50	185	36	Lipari	Gabellotto
I Faraglioni	29022	Ustica 380	Bruker III-SD	10852	279	16	42	170	36	Lipari	Gabellotto
I Faraglioni	29023	Ustica 381	Bruker III-SD	12224	270	19	37	177	32	Lipari	Gabellotto
I Faraglioni	29024	Ustica 382	Bruker III-SD	13559	314	15	46	173	37	Lipari	Gabellotto
I Faraglioni	29025	Ustica 383	Bruker III-SD	13991	316	20	51	196	37	Lipari	Gabellotto
I Faraglioni	29026	Ustica 384	Bruker III-SD	11048	280	19	44	169	38	Lipari	Gabellotto
I Faraglioni	29027	Ustica 385	Bruker III-SD	13989	331	26	45	183	39	Lipari	Gabellotto
I Faraglioni	29028	Ustica 386	Bruker III-SD	54433	171	14	171	1669	373	Pantelleria	Balata dei Turchi
I Faraglioni	29029	Ustica 387	Bruker III-SD	51801	168	19	158	1521	350	Pantelleria	Balata dei Turchi
I Faraglioni	29030	Ustica 388	Bruker III-SD	11390	261	19	40	158	31	Lipari	Gabellotto
I Faraglioni	29031	Ustica 389	Bruker III-SD	14186	286	19	44	164	32	Lipari	Gabellotto
I Faraglioni	29032	Ustica 390	Bruker III-SD	11571	295	17	34	168	35	Lipari	Gabellotto
I Faraglioni	29033	Ustica 391	Bruker III-SD	11200	272	23	43	166	34	Lipari	Gabellotto
I Faraglioni	29034	Ustica 392	Bruker III-SD	11932	279	24	41	169	36	Lipari	Gabellotto

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I Faraglioni	29035	Ustica 393	Bruker III-SD	15875	270	23	52	161	36	Lipari	Gabellotto
I Faraglioni	29036	Ustica 394	Bruker III-SD	17387	342	25	51	184	44	Lipari	Gabellotto
I Faraglioni	29037	Ustica 395	Bruker III-SD	13192	317	19	45	181	38	Lipari	Gabellotto
I Faraglioni	29038	Ustica 396	Bruker III-SD	11957	283	18	47	182	33	Lipari	Gabellotto
I Faraglioni	29039	Ustica 397	Bruker III-SD	10813	280	19	44	167	33	Lipari	Gabellotto
I Faraglioni	29040	Ustica 398	Bruker III-SD	10235	246	18	48	153	31	Lipari	Gabellotto
I Faraglioni	29041	Ustica 399	Bruker III-SD	10698	265	17	35	155	35	Lipari	Gabellotto
I Faraglioni	29042	Ustica 400	Bruker III-SD	12126	280	18	47	172	35	Lipari	Gabellotto
I Faraglioni	29043	Ustica 401	Bruker III-SD	11400	287	23	48	173	30	Lipari	Gabellotto
I Faraglioni	29044	Ustica 402	Bruker III-SD	11733	276	18	37	169	36	Lipari	Gabellotto
I Faraglioni	29045	Ustica 403	Bruker III-SD							not obsid.	
I Faraglioni	29046	Ustica 404	Bruker III-SD	12619	313	22	40	181	39	Lipari	Gabellotto
I Faraglioni	29047	Ustica 405	Bruker III-SD	11888	285	18	52	176	36	Lipari	Gabellotto
I Faraglioni	29048	Ustica 406	Bruker III-SD	11049	272	20	41	163	35	Lipari	Gabellotto
I Faraglioni	29049	Ustica 407	Bruker III-SD	13538	329	20	44	190	39	Lipari	Gabellotto
I Faraglioni	29050	Ustica 408	Bruker III-SD	15803	300	23	44	174	36	Lipari	Gabellotto
I Faraglioni	29051	Ustica 409	Bruker III-SD	12181	277	18	44	171	35	Lipari	Gabellotto
I Faraglioni	29052	Ustica 410	Bruker III-SD	13092	288	20	41	167	34	Lipari	Gabellotto
I Faraglioni	29053	Ustica 411	Bruker III-SD	11409	273	19	38	169	35	Lipari	Gabellotto
I Faraglioni	29054	Ustica 412	Bruker III-SD	12019	304	20	42	189	37	Lipari	Gabellotto
I Faraglioni	29055	Ustica 413	Bruker III-SD	12119	285	20	46	165	38	Lipari	Gabellotto
I Faraglioni	29056	Ustica 414	Bruker III-SD	12037	300	19	43	173	37	Lipari	Gabellotto
I Faraglioni	29057	Ustica 415	Bruker III-SD	10604	283	19	45	168	31	Lipari	Gabellotto
I Faraglioni	29058	Ustica 416	Bruker III-SD	13762	272	20	41	170	38	Lipari	Gabellotto
I Faraglioni	29059	Ustica 417	Bruker III-SD	11216	300	16	39	177	37	Lipari	Gabellotto
I Faraglioni	29060	Ustica 418	Bruker III-SD	11013	275	18	41	158	34	Lipari	Gabellotto
I Faraglioni	29061	Ustica 419	Bruker III-SD	11842	295	18	42	174	36	Lipari	Gabellotto
I Faraglioni	29062	Ustica 420	Bruker III-SD	11082	291	20	43	173	31	Lipari	Gabellotto
I Faraglioni	29063	Ustica 421	Bruker III-SD	11169	296	16	47	169	37	Lipari	Gabellotto
I Faraglioni	29064	Ustica 422	Bruker III-SD	10995	273	18	43	166	35	Lipari	Gabellotto
I Faraglioni	29065	Ustica 423	Bruker III-SD	54581	170	16	166	1615	372	Pantelleria	Balata dei Turchi
I Faraglioni	29066	Ustica 424	Bruker III-SD	11493	274	17	41	177	36	Lipari	Gabellotto
I Faraglioni	29067	Ustica 425	Bruker III-SD	12421	285	18	45	169	37	Lipari	Gabellotto
I Faraglioni	29068	Ustica 426	Bruker III-SD	11692	293	20	49	166	35	Lipari	Gabellotto
I Faraglioni	29069	Ustica 427	Bruker III-SD	11309	271	22	39	159	35	Lipari	Gabellotto
I Faraglioni	29070	Ustica 428	Bruker III-SD	10592	269	14	42	159	36	Lipari	Gabellotto
I Faraglioni	29071	Ustica 429	Bruker III-SD	13757	301	23	48	181	39	Lipari	Gabellotto
I Faraglioni	29072	Ustica 430	Bruker III-SD	11544	293	22	43	172	35	Lipari	Gabellotto

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I Faraglioni	29073	Ustica 431	Bruker III-SD	11026	269	21	44	173	37	Lipari	Gabellotto
I Faraglioni	29074	Ustica 432	Bruker III-SD	14346	302	24	45	176	39	Lipari	Gabellotto
I Faraglioni	29075	Ustica 433	Bruker III-SD	12166	303	21	40	180	35	Lipari	Gabellotto
I Faraglioni	29076	Ustica 434	Bruker III-SD	13588	332	19	49	183	37	Lipari	Gabellotto
I Faraglioni	29077	Ustica 435	Bruker III-SD	13668	308	22	49	183	38	Lipari	Gabellotto
I Faraglioni	29078	Ustica 436	Bruker III-SD	12195	272	17	53	167	36	Lipari	Gabellotto
I Faraglioni	29079	Ustica 437	Bruker III-SD	12488	280	20	31	166	32	Lipari	Gabellotto
I Faraglioni	29080	Ustica 438	Bruker III-SD	11488	290	21	44	167	36	Lipari	Gabellotto
I Faraglioni	29081	Ustica 439	Bruker III-SD	53925	194	9	177	1631	366	Pantelleria	Balata dei Turchi
I Faraglioni	29082	Ustica 440	Bruker III-SD	10533	261	15	41	165	31	Lipari	Gabellotto
I Faraglioni	29083	Ustica 441	Bruker III-SD	13068	310	17	42	178	35	Lipari	Gabellotto
I Faraglioni	29084	Ustica 442	Bruker III-SD	11050	277	20	45	158	35	Lipari	Gabellotto
I Faraglioni	29085	Ustica 443	Bruker III-SD	13064	286	23	45	179	35	Lipari	Gabellotto
I Faraglioni	29086	Ustica 444	Bruker III-SD	11798	277	17	37	163	35	Lipari	Gabellotto
I Faraglioni	29087	Ustica 445	Bruker III-SD	12292	313	17	45	167	37	Lipari	Gabellotto
I Faraglioni	29088	Ustica 446	Bruker III-SD	11163	268	19	43	165	37	Lipari	Gabellotto
I Faraglioni	29089	Ustica 447	Bruker III-SD	12618	297	18	45	172	37	Lipari	Gabellotto
I Faraglioni	29090	Ustica 448	Bruker III-SD	11291	280	18	40	176	32	Lipari	Gabellotto
I Faraglioni	29091	Ustica gl.1	Bruker III-SD							not obsid.	
Piano Cardoni Alto	28733	Ustica 91	Bruker III-SD	55293	175	12	172	1641	372	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28734	Ustica 92	Bruker III-SD	12241	273	19	44	167	35	Lipari	Gabellotto
Piano Cardoni Alto	28735	Ustica 93	Bruker III-SD	11764	276	19	40	165	38	Lipari	Gabellotto
Piano Cardoni Alto	28736	Ustica 94	Bruker III-SD	12177	301	17	41	178	36	Lipari	Gabellotto
Piano Cardoni Alto	28737	Ustica 95	Bruker III-SD	54099	166	10	173	1580	354	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28738	Ustica 96	Bruker III-SD	11787	291	18	43	172	36	Lipari	Gabellotto
Piano Cardoni Alto	28739	Ustica 97	Bruker III-SD	11607	274	14	42	169	32	Lipari	Gabellotto
Piano Cardoni Alto	28740	Ustica 98	Bruker III-SD	12403	274	23	40	170	36	Lipari	Gabellotto
Piano Cardoni Alto	28741	Ustica 99	Bruker III-SD	12740	295	16	48	181	36	Lipari	Gabellotto
Piano Cardoni Alto	28742	Ustica 100	Bruker III-SD	13866	286	17	40	189	38	Lipari	Gabellotto
Piano Cardoni Alto	28743	Ustica 101	Bruker III-SD	54160	176	12	174	1663	365	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28744	Ustica 102	Bruker III-SD	56126	180	12	186	1686	367	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28745	Ustica 103	Bruker III-SD	12389	297	19	43	172	35	Lipari	Gabellotto
Piano Cardoni Alto	28746	Ustica 104	Bruker III-SD	12964	327	20	42	184	35	Lipari	Gabellotto
Piano Cardoni Alto	28747	Ustica 105	Bruker III-SD	14241	334	19	50	195	39	Lipari	Gabellotto
Piano Cardoni Alto	28748	Ustica 106	Bruker III-SD	12413	292	17	44	166	37	Lipari	Gabellotto
Piano Cardoni Alto	28749	Ustica 107	Bruker III-SD	12087	286	18	41	177	34	Lipari	Gabellotto
Piano Cardoni Alto	28750	Ustica 108	Bruker III-SD	12108	292	22	49	170	37	Lipari	Gabellotto
Piano Cardoni Alto	28751	Ustica 109	Bruker III-SD	15829	347	21	43	183	34	Lipari	Gabellotto

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Piano Cardoni Alto	28752	Ustica 110	Bruker III-SD	62409	207	13	197	1874	404	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28753	Ustica 111	Bruker III-SD	11186	278	20	41	165	35	Lipari	Gabellotto
Piano Cardoni Alto	28754	Ustica 112	Bruker III-SD	11157	284	17	42	165	32	Lipari	Gabellotto
Piano Cardoni Alto	28755	Ustica 113	Bruker III-SD	11687	271	22	44	162	37	Lipari	Gabellotto
Piano Cardoni Alto	28756	Ustica 114	Bruker III-SD	11844	286	19	49	175	38	Lipari	Gabellotto
Piano Cardoni Alto	28757	Ustica 115	Bruker III-SD	11797	275	21	43	163	33	Lipari	Gabellotto
Piano Cardoni Alto	28758	Ustica 116	Bruker III-SD	17950	287	23	45	179	38	Lipari	Gabellotto
Piano Cardoni Alto	28759	Ustica 117	Bruker III-SD	12591	282	21	48	172	35	Lipari	Gabellotto
Piano Cardoni Alto	28760	Ustica 118	Bruker III-SD	12627	289	20	38	171	36	Lipari	Gabellotto
Piano Cardoni Alto	28761	Ustica 119	Bruker III-SD	11498	297	21	43	174	35	Lipari	Gabellotto
Piano Cardoni Alto	28762	Ustica 120	Bruker III-SD	13275	304	16	40	180	37	Lipari	Gabellotto
Piano Cardoni Alto	28763	Ustica 121	Bruker III-SD	53861	182	13	165	1607	356	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28764	Ustica 122	Bruker III-SD	11917	283	18	38	177	36	Lipari	Gabellotto
Piano Cardoni Alto	28765	Ustica 123	Bruker III-SD	11880	291	19	44	177	37	Lipari	Gabellotto
Piano Cardoni Alto	28766	Ustica 124	Bruker III-SD	11372	271	16	40	160	38	Lipari	Gabellotto
Piano Cardoni Alto	28767	Ustica 125	Bruker III-SD	55808	182	14	179	1692	374	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28768	Ustica 126	Bruker III-SD	11427	282	16	41	169	37	Lipari	Gabellotto
Piano Cardoni Alto	28769	Ustica 127	Bruker III-SD	11352	282	21	44	174	38	Lipari	Gabellotto
Piano Cardoni Alto	28770	Ustica 128	Bruker III-SD	57541	188	14	187	1731	378	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28771	Ustica 129	Bruker III-SD	11528	276	20	42	171	34	Lipari	Gabellotto
Piano Cardoni Alto	28772	Ustica 130	Bruker III-SD	12461	296	17	47	170	38	Lipari	Gabellotto
Piano Cardoni Alto	28773	Ustica 131	Bruker III-SD	13319	322	16	43	187	39	Lipari	Gabellotto
Piano Cardoni Alto	28774	Ustica 132	Bruker III-SD	11443	275	17	44	167	36	Lipari	Gabellotto
Piano Cardoni Alto	28775	Ustica 133	Bruker III-SD	55424	188	13	179	1751	400	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28776	Ustica 134	Bruker III-SD	13151	303	17	43	182	37	Lipari	Gabellotto
Piano Cardoni Alto	28777	Ustica 135	Bruker III-SD	11959	281	18	41	169	36	Lipari	Gabellotto
Piano Cardoni Alto	28778	Ustica 136	Bruker III-SD	11340	297	15	45	161	37	Lipari	Gabellotto
Piano Cardoni Alto	28779	Ustica 137	Bruker III-SD	12609	293	19	44	178	34	Lipari	Gabellotto
Piano Cardoni Alto	28780	Ustica 138	Bruker III-SD	12259	298	17	42	172	36	Lipari	Gabellotto
Piano Cardoni Alto	28781	Ustica 139	Bruker III-SD	12326	294	18	46	175	36	Lipari	Gabellotto
Piano Cardoni Alto	28782	Ustica 140	Bruker III-SD	58668	183	9	189	1749	368	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28783	Ustica 141	Bruker III-SD	12187	306	21	43	175	35	Lipari	Gabellotto
Piano Cardoni Alto	28784	Ustica 142	Bruker III-SD	12513	292	16	43	179	35	Lipari	Gabellotto
Piano Cardoni Alto	28785	Ustica 143	Bruker III-SD	11936	306	18	43	180	41	Lipari	Gabellotto
Piano Cardoni Alto	28786	Ustica 144	Bruker III-SD	12445	322	16	39	171	36	Lipari	Gabellotto
Piano Cardoni Alto	28787	Ustica 145	Bruker III-SD	13325	297	17	43	177	34	Lipari	Gabellotto
Piano Cardoni Alto	28788	Ustica 146	Bruker III-SD	11184	266	20	39	157	31	Lipari	Gabellotto
Piano Cardoni Alto	28789	Ustica 147	Bruker III-SD	14354	320	19	47	186	36	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Piano Cardoni Alto	28790	Ustica 148	Bruker III-SD	12850	301	17	43	164	37	Lipari	Gabellotto
Piano Cardoni Alto	28791	Ustica 149	Bruker III-SD	14531	353	15	50	197	43	Lipari	Gabellotto
Piano Cardoni Alto	28792	Ustica 150	Bruker III-SD	15705	367	27	38	195	42	Lipari	Gabellotto
Piano Cardoni Alto	28793	Ustica 151	Bruker III-SD	14539	345	23	47	189	37	Lipari	Gabellotto
Piano Cardoni Alto	28794	Ustica 152	Bruker III-SD	12816	303	20	47	185	39	Lipari	Gabellotto
Piano Cardoni Alto	28795	Ustica 153	Bruker III-SD	13981	311	20	49	176	41	Lipari	Gabellotto
Piano Cardoni Alto	28796	Ustica 154	Bruker III-SD	13627	298	22	43	216	41	Lipari	Gabellotto
Piano Cardoni Alto	28797	Ustica 155	Bruker III-SD	13044	306	18	40	173	38	Lipari	Gabellotto
Piano Cardoni Alto	28798	Ustica 156	Bruker III-SD	12046	281	18	44	169	37	Lipari	Gabellotto
Piano Cardoni Alto	28799	Ustica 157	Bruker III-SD	11432	275	17	42	172	34	Lipari	Gabellotto
Piano Cardoni Alto	28800	Ustica 158	Bruker III-SD	11304	296	21	38	168	36	Lipari	Gabellotto
Piano Cardoni Alto	28801	Ustica 159	Bruker III-SD	10976	262	16	52	156	28	Lipari	Gabellotto
Piano Cardoni Alto	28802	Ustica 160	Bruker III-SD	13553	297	16	42	170	32	Lipari	Gabellotto
Piano Cardoni Alto	28803	Ustica 161	Bruker III-SD	11798	283	20	46	166	35	Lipari	Gabellotto
Piano Cardoni Alto	28804	Ustica 162	Bruker III-SD	11250	267	21	42	162	29	Lipari	Gabellotto
Piano Cardoni Alto	28805	Ustica 163	Bruker III-SD	11284	274	21	41	166	37	Lipari	Gabellotto
Piano Cardoni Alto	28806	Ustica 164	Bruker III-SD	54388	177	15	164	1624	370	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28807	Ustica 165	Bruker III-SD	11899	267	17	42	174	39	Lipari	Gabellotto
Piano Cardoni Alto	28808	Ustica 166	Bruker III-SD	12240	295	21	46	176	37	Lipari	Gabellotto
Piano Cardoni Alto	28809	Ustica 167	Bruker III-SD	13356	318	20	50	182	41	Lipari	Gabellotto
Piano Cardoni Alto	28810	Ustica 168	Bruker III-SD	12273	317	17	52	184	35	Lipari	Gabellotto
Piano Cardoni Alto	28811	Ustica 169	Bruker III-SD	11956	299	18	42	179	38	Lipari	Gabellotto
Piano Cardoni Alto	28812	Ustica 170	Bruker III-SD	12394	295	17	46	173	35	Lipari	Gabellotto
Piano Cardoni Alto	28813	Ustica 171	Bruker III-SD	11953	279	15	42	172	32	Lipari	Gabellotto
Piano Cardoni Alto	28814	Ustica 172	Bruker III-SD	11347	277	17	41	171	39	Lipari	Gabellotto
Piano Cardoni Alto	28815	Ustica 173	Bruker III-SD	56228	187	10	172	1619	371	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28816	Ustica 174	Bruker III-SD	12167	281	20	38	159	34	Lipari	Gabellotto
Piano Cardoni Alto	28817	Ustica 175	Bruker III-SD	12080	294	18	39	171	34	Lipari	Gabellotto
Piano Cardoni Alto	28818	Ustica 176	Bruker III-SD	56974	189	13	176	1694	367	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28819	Ustica 177	Bruker III-SD	12298	305	16	38	168	39	Lipari	Gabellotto
Piano Cardoni Alto	28820	Ustica 178	Bruker III-SD	11931	291	16	47	171	37	Lipari	Gabellotto
Piano Cardoni Alto	28821	Ustica 179	Bruker III-SD	55259	176	9	171	1637	365	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28822	Ustica 180	Bruker III-SD	12485	286	18	44	165	36	Lipari	Gabellotto
Piano Cardoni Alto	28823	Ustica 181	Bruker III-SD	12359	277	19	46	174	37	Lipari	Gabellotto
Piano Cardoni Alto	28824	Ustica 182	Bruker III-SD	12240	295	21	49	177	36	Lipari	Gabellotto
Piano Cardoni Alto	28825	Ustica 183	Bruker III-SD	56433	163	14	170	1678	373	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	28826	Ustica 184	Bruker III-SD	12171	292	21	40	169	34	Lipari	Gabellotto
Piano Cardoni Alto	28827	Ustica 185	Bruker III-SD	11940	297	16	37	172	39	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Piano Cardoni Alto	28828	Ustica 186	Bruker III-SD	13548	326	20	43	192	40	Lipari	Gabellotto
Piano Cardoni Alto	31485		Bruker 5i	11416	262	13	47	146	34	Lipari	Gabellotto
Piano Cardoni Alto	31486		Bruker 5i	12000	285	16	45	157	33	Lipari	Gabellotto
Piano Cardoni Alto	31487		Bruker 5i	12006	278	14	44	155	36	Lipari	Gabellotto
Piano Cardoni Alto	31488		Bruker 5i	11715	274	13	46	154	35	Lipari	Gabellotto
Piano Cardoni Alto	31489		Bruker 5i	11323	279	15	47	155	27	Lipari	Gabellotto
Piano Cardoni Alto	31490		Bruker 5i	10604	264	13	42	145	30	Lipari	Gabellotto
Piano Cardoni Alto	31491		Bruker 5i	11319	268	14	47	147	33	Lipari	Gabellotto
Piano Cardoni Alto	31491b		Bruker 5i	11372	271	13	46	150	34	Lipari	Gabellotto
Piano Cardoni Alto	31492		Bruker 5i	12623	298	15	49	163	36	Lipari	Gabellotto
Piano Cardoni Alto	31493		Bruker 5i	11484	284	15	43	151	34	Lipari	Gabellotto
Piano Cardoni Alto	31494		Bruker 5i	55687	175	6	157	1574	379	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31495		Bruker 5i	57105	178	5	179	1633	384	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31496		Bruker 5i	52753	167	5	171	1509	371	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31497		Bruker 5i	59568	181	7	181	1653	398	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31498		Bruker 5i	58919	177	5	146	1674	404	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31499		Bruker 5i	59361	182	8	181	1641	394	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31500		Bruker 5i	54505	168	4	157	1560	379	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31501		Bruker 5i	49554	167	4	159	1451	353	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31502		Bruker 5i	11573	280	16	44	152	33	Lipari	Gabellotto
Piano Cardoni Alto	31503		Bruker 5i	12009	282	15	46	154	35	Lipari	Gabellotto
Piano Cardoni Alto	31504		Bruker 5i	11541	279	12	46	153	33	Lipari	Gabellotto
Piano Cardoni Alto	31505		Bruker 5i	57828	178	6	180	1651	396	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31506		Bruker 5i	57483	176	6	180	1647	394	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31507		Bruker 5i	11511	284	13	44	154	35	Lipari	Gabellotto
Piano Cardoni Alto	31508		Bruker 5i	11394	270	13	45	147	34	Lipari	Gabellotto
Piano Cardoni Alto	31509		Bruker 5i	12378	283	14	47	155	34	Lipari	Gabellotto
Piano Cardoni Alto	31510		Bruker 5i	11880	274	14	46	153	34	Lipari	Gabellotto
Piano Cardoni Alto	31511		Bruker 5i	11817	286	13	45	157	36	Lipari	Gabellotto
Piano Cardoni Alto	31512		Bruker 5i	54052	170	4	163	1495	361	Pantelleria	Balata dei Turchi
Piano Cardoni Alto	31513		Bruker 5i	11770	276	13	44	153	33	Lipari	Gabellotto
Piano Cardoni Alto	31514		Bruker 5i	11945	285	14	48	156	34	Lipari	Gabellotto
Piano Cardoni Alto	31515		Bruker 5i	13184	295	16	48	160	34	Lipari	Gabellotto
Piano Cardoni Alto	31516		Bruker 5i	11904	280	14	47	152	34	Lipari	Gabellotto
Piano Cardoni Alto	31517		Bruker 5i	11773	285	16	48	156	35	Lipari	Gabellotto
Piano Cardoni Alto	31518		Bruker 5i	13763	323	17	50	167	36	Lipari	Gabellotto
Piano Cardoni Alto	31519		Bruker 5i	12884	291	15	52	157	34	Lipari	Gabellotto
Piano Cardoni Alto	31521		Bruker 5i	12249	273	14	45	146	35	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Piano Cardoni Alto	31522		Bruker 5i	13839	282	17	46	164	36	Lipari	Gabellotto
Piano Cardoni Alto	31523		Bruker 5i	11153	261	14	44	145	32	Lipari	Gabellotto
Piano dei Cardoni	38253	USCAR01	Bruker 5g	14417	302	16	48	153	36	Lipari	Gabellotto
Piano dei Cardoni	38254	USCAR02	Bruker 5g	12707	285	15	46	158	34	Lipari	Gabellotto
Piano dei Cardoni	38255	USCAR03	Bruker 5g	12342	301	12	46	133	39	Lipari	Gabellotto
Piano dei Cardoni	38256	USCAR04	Bruker 5g	13672	312	18	44	156	34	Lipari	Gabellotto
Piano dei Cardoni	38257	USCAR05	Bruker 5g	11061	252	13	44	128	33	Lipari	Gabellotto
Piano dei Cardoni	38258	USCAR06	Bruker 5g	12500	283	17	47	135	33	Lipari	Gabellotto
Piano dei Cardoni	38259	USCAR07	Bruker 5g	11896	264	15	45	129	32	Lipari	Gabellotto
Piano dei Cardoni	38260	USCAR08	Bruker 5g	13188	274	17	47	149	36	Lipari	Gabellotto
Piano dei Cardoni	38261	USCAR09	Bruker 5g	11977	284	15	48	154	35	Lipari	Gabellotto
Piano dei Cardoni	38262	USCAR10	Bruker 5g	12247	281	19	47	150	33	Lipari	Gabellotto
Piano dei Cardoni	38263	USCAR11	Bruker 5g	11815	281	17	43	149	32	Lipari	Gabellotto
Piano dei Cardoni	38264	USCAR12	Bruker 5g	11245	261	15	42	146	31	Lipari	Gabellotto
Piano dei Cardoni	38265	USCAR13	Bruker 5g	13818	302	22	59	167	36	Lipari	Gabellotto
Piano dei Cardoni	38266	USCAR14	Bruker 5g	11560	266	18	40	140	34	Lipari	Gabellotto
Piano dei Cardoni	38267	USCAR15	Bruker 5g	11695	269	15	46	133	32	Lipari	Gabellotto
Piano dei Cardoni	38268	USCAR16	Bruker 5g	13687	298	19	49	138	33	Lipari	Gabellotto
Piano dei Cardoni	38269	USCAR17	Bruker 5g	12263	292	16	46	155	38	Lipari	Gabellotto
Piano dei Cardoni	38270	USCAR18	Bruker 5g	57614	187	4	179	1885	393	Pantelleria	Balata dei Turchi
Piano dei Cardoni	38271	USCAR19	Bruker 5g	12245	287	19	42	128	36	Lipari	Gabellotto
Piano dei Cardoni	38272	USCAR20	Bruker 5g								not obsid.
Piano dei Cardoni	38273	USCAR21	Bruker 5g	12435	298	15	52	152	34	Lipari	Gabellotto
Piano dei Cardoni	38274	USCAR22	Bruker 5g	11746	282	15	42	147	35	Lipari	Gabellotto
Piano dei Cardoni	38275	USCAR23	Bruker 5g	12664	287	15	45	136	33	Lipari	Gabellotto
Piano dei Cardoni	38276	USCAR24	Bruker 5g	62487	186	7	181	1941	395	Pantelleria	Balata dei Turchi
Piano dei Cardoni	38277	USCAR25	Bruker 5g	13096	290	15	46	137	35	Lipari	Gabellotto
San Bartolicchio	28829	Ustica 187	Bruker III-SD	53769	181	15	164	1572	368	Pantelleria	Balata dei Turchi
San Bartolicchio	28830	Ustica 188	Bruker III-SD	54310	172	16	164	1568	340	Pantelleria	Balata dei Turchi
San Bartolicchio	28831	Ustica 189	Bruker III-SD	55810	193	11	183	1624	365	Pantelleria	Balata dei Turchi
San Bartolicchio	28832	Ustica 190	Bruker III-SD								not obsid.
San Bartolicchio	28833	Ustica 191	Bruker III-SD	54425	188	16	176	1619	366	Pantelleria	Balata dei Turchi
San Bartolicchio	28834	Ustica 192	Bruker III-SD	12263	281	17	45	172	36	Lipari	Gabellotto
San Bartolicchio	28835	Ustica 193	Bruker III-SD	12219	272	17	42	165	35	Lipari	Gabellotto
San Bartolicchio	28836	Ustica 194	Bruker III-SD	12296	287	19	44	181	36	Lipari	Gabellotto
San Bartolicchio	28837	Ustica 195	Bruker III-SD	12371	288	21	46	184	35	Lipari	Gabellotto
San Bartolicchio	28838	Ustica 196	Bruker III-SD	14069	298	23	43	176	38	Lipari	Gabellotto
San Bartolicchio	28839	Ustica 197	Bruker III-SD	12597	286	18	38	172	35	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
San Bartolicchio	28840	Ustica 198	Bruker III-SD	55754	176	14	179	1698	370	Pantelleria	Balata dei Turchi
Pirozza-Spalmatore	28655	Ustica 13	Bruker III-SD	11144	283	18	38	178	39	Lipari	Gabellotto
Pirozza-Spalmatore	28656	Ustica 14	Bruker III-SD	12522	312	18	54	180	43	Lipari	Gabellotto
Pirozza-Spalmatore	28657	Ustica 15	Bruker III-SD	12647	310	22	43	176	39	Lipari	Gabellotto
Pirozza-Spalmatore	28658	Ustica 16	Bruker III-SD	12615	314	21	46	181	36	Lipari	Gabellotto
Pirozza-Spalmatore	28659	Ustica 17	Bruker III-SD	11948	286	18	41	169	40	Lipari	Gabellotto
Pirozza-Spalmatore	28660	Ustica 18	Bruker III-SD	11969	287	16	47	168	33	Lipari	Gabellotto
Pirozza-Spalmatore	28661	Ustica 19	Bruker III-SD	51746	104	9	88	820	179	Pantelleria	Lago di Venere 2
Pirozza-Spalmatore	28662	Ustica 20	Bruker III-SD	13776	340	15	49	181	39	Lipari	Gabellotto
Pirozza-Spalmatore	28663	Ustica 21	Bruker III-SD	11808	307	16	38	183	37	Lipari	Gabellotto
Pirozza-Spalmatore	28664	Ustica 22	Bruker III-SD	12519	299	18	46	172	32	Lipari	Gabellotto
Pirozza-Spalmatore	28665	Ustica 23	Bruker III-SD	13377	317	18	46	189	40	Lipari	Gabellotto
Pirozza-Spalmatore	28666	Ustica 24	Bruker III-SD	11021	280	18	37	162	34	Lipari	Gabellotto
Pirozza-Spalmatore	28667	Ustica 25	Bruker III-SD	10583	255	23	41	164	34	Lipari	Gabellotto
Pirozza-Spalmatore	28668	Ustica 26	Bruker III-SD	11863	288	13	42	172	36	Lipari	Gabellotto
Pirozza-Spalmatore	28669	Ustica 27	Bruker III-SD	12780	308	22	50	173	40	Lipari	Gabellotto
Pirozza-Spalmatore	28670	Ustica 28	Bruker III-SD	54797	171	15	179	1669	350	Pantelleria	Balata dei Turchi
Pirozza-Spalmatore	28671	Ustica 29	Bruker III-SD	13659	301	19	40	179	35	Lipari	Gabellotto
Pirozza-Spalmatore	28672	Ustica 30	Bruker III-SD	12471	308	22	46	182	44	Lipari	Gabellotto
Pirozza-Spalmatore	28673	Ustica 31	Bruker III-SD	15847	364	20	52	200	37	Lipari	Gabellotto
Pirozza-Spalmatore	28674	Ustica 32	Bruker III-SD	12276	297	22	47	173	40	Lipari	Gabellotto
Pirozza-Spalmatore	28675	Ustica 33	Bruker III-SD	59186	111	10	104	916	214	Pantelleria	Lago di Venere 2
Pirozza-Spalmatore	28676	Ustica 34	Bruker III-SD	11757	278	19	42	175	36	Lipari	Gabellotto
Pirozza-Spalmatore	28677	Ustica 35	Bruker III-SD	12099	290	21	48	172	38	Lipari	Gabellotto
Pirozza-Spalmatore	28678	Ustica 36	Bruker III-SD	12866	296	23	51	176	38	Lipari	Gabellotto
Pirozza-Spalmatore	28679	Ustica 37	Bruker III-SD	13389	307	20	48	184	40	Lipari	Gabellotto
Pirozza-Spalmatore	28680	Ustica 38	Bruker III-SD	15184	358	17	49	194	40	Lipari	Gabellotto
Pirozza-Spalmatore	28681	Ustica 39	Bruker III-SD	14791	320	23	52	203	35	Lipari	Gabellotto
Pirozza-Spalmatore	28682	Ustica 40	Bruker III-SD	12770	291	18	40	182	36	Lipari	Gabellotto
Pirozza-Spalmatore	28693	Ustica 51	Bruker III-SD	11387	288	17	47	165	39	Lipari	Gabellotto
Tramontana	31446		Bruker 5i	11717	258	15	42	145	30	Lipari	Gabellotto
Tramontana	31447		Bruker 5i	12948	305	15	48	139	32	Lipari	Gabellotto
Tramontana	31448		Bruker 5i	11424	272	14	43	154	32	Lipari	Gabellotto
Tramontana	31449		Bruker 5i	12401	276	16	45	153	32	Lipari	Gabellotto
Tramontana	31450		Bruker 5i	12280	290	17	45	158	37	Lipari	Gabellotto
Tramontana	31451		Bruker 5i	57650	182	6	166	1622	387	Pantelleria	Balata dei Turchi
Tramontana	31452		Bruker 5i	14100	328	16	50	169	37	Lipari	Gabellotto
Tramontana	31453		Bruker 5i	12529	298	14	48	158	35	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31454		Bruker 5i	12001	280	16	46	154	34	Lipari	Gabellotto
Tramontana	31455		Bruker 5i	11665	283	14	45	150	33	Lipari	Gabellotto
Tramontana	31456		Bruker 5i	12090	289	15	43	156	33	Lipari	Gabellotto
Tramontana	31457		Bruker 5i	12189	287	14	47	156	34	Lipari	Gabellotto
Tramontana	31458		Bruker 5i	11897	266	17	45	148	33	Lipari	Gabellotto
Tramontana	31459		Bruker 5i	12916	295	15	50	159	36	Lipari	Gabellotto
Tramontana	31460		Bruker 5i	11763	270	14	46	151	34	Lipari	Gabellotto
Tramontana	31461		Bruker 5i	12223	282	15	43	153	36	Lipari	Gabellotto
Tramontana	31462		Bruker 5i	11166	280	14	45	150	34	Lipari	Gabellotto
Tramontana	31463		Bruker 5i	11354	272	12	47	139	32	Lipari	Gabellotto
Tramontana	31464		Bruker 5i	13197	291	31	46	153	35	Lipari	Gabellotto
Tramontana	31465		Bruker 5i	59656	186	5	185	1677	400	Pantelleria	Balata dei Turchi
Tramontana	31466		Bruker 5i	12823	298	16	46	159	36	Lipari	Gabellotto
Tramontana	31467		Bruker 5i	12801	289	15	46	157	36	Lipari	Gabellotto
Tramontana	31468		Bruker 5i	12575	294	15	48	158	35	Lipari	Gabellotto
Tramontana	31469		Bruker 5i	12460	277	15	45	155	32	Lipari	Gabellotto
Tramontana	31470		Bruker 5i	11234	255	12	42	143	32	Lipari	Gabellotto
Tramontana	31471		Bruker 5i	11986	280	15	42	146	30	Lipari	Gabellotto
Tramontana	31472		Bruker 5i	11520	274	13	45	147	33	Lipari	Gabellotto
Tramontana	31473		Bruker 5i	11795	269	14	46	150	32	Lipari	Gabellotto
Tramontana	31474		Bruker 5i	12197	265	15	43	145	33	Lipari	Gabellotto
Tramontana	31475		Bruker 5i	12144	278	14	45	149	34	Lipari	Gabellotto
Tramontana	31476		Bruker 5i	13130	305	16	51	162	33	Lipari	Gabellotto
Tramontana	31477		Bruker 5i	11742	275	14	47	151	34	Lipari	Gabellotto
Tramontana	31478		Bruker 5i	61540	189	8	184	1734	411	Pantelleria	Balata dei Turchi
Tramontana	31479		Bruker 5i	12382	289	15	46	158	34	Lipari	Gabellotto
Tramontana	31480		Bruker 5i	58589	183	5	179	1615	385	Pantelleria	Balata dei Turchi
Tramontana	31481		Bruker 5i	11674	282	14	48	155	35	Lipari	Gabellotto
Tramontana	31482		Bruker 5i							not obsid.	
Tramontana	31483		Bruker 5i							not obsid.	
Tramontana	31484		Bruker 5i							not obsid.	
Tramontana	31531		Bruker 5i	10737	263	14	45	145	32	Lipari	Gabellotto
Tramontana	31532		Bruker 5i	11634	279	15	42	151	34	Lipari	Gabellotto
Tramontana	31533		Bruker 5i	12131	282	14	44	152	35	Lipari	Gabellotto
Tramontana	31534		Bruker 5i	57373	180	7	178	1630	394	Pantelleria	Balata dei Turchi
Tramontana	31535		Bruker 5i	12444	284	11	49	148	33	Lipari	Gabellotto
Tramontana	31536		Bruker 5i	12353	295	15	49	159	38	Lipari	Gabellotto
Tramontana	31537		Bruker 5i	11181	269	13	43	147	34	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31538		Bruker 5i	55873	178	6	174	1581	380	Pantelleria	Balata dei Turchi
Tramontana	31539		Bruker 5i	12727	295	26	48	151	34	Lipari	Gabellotto
Tramontana	31540		Bruker 5i	12644	276	15	49	150	32	Lipari	Gabellotto
Tramontana	31541		Bruker 5i	12136	287	15	44	155	32	Lipari	Gabellotto
Tramontana	31542		Bruker 5i	12255	282	15	48	162	34	Lipari	Gabellotto
Tramontana	31543		Bruker 5i	12077	285	15	47	156	28	Lipari	Gabellotto
Tramontana	31544		Bruker 5i	14049	311	17	52	166	36	Lipari	Gabellotto
Tramontana	31545		Bruker 5i	13505	297	15	50	163	35	Lipari	Gabellotto
Tramontana	31546		Bruker 5i	57684	178	6	161	1574	376	Pantelleria	Balata dei Turchi
Tramontana	31547		Bruker 5i	12130	290	15	49	154	35	Lipari	Gabellotto
Tramontana	31548		Bruker 5i	12482	294	15	44	157	37	Lipari	Gabellotto
Tramontana	31549		Bruker 5i	13672	308	17	51	167	37	Lipari	Gabellotto
Tramontana	31550		Bruker 5i	63201	100	2	86	851	204	Pantelleria	Lago di Venere 2
Tramontana	31551		Bruker 5i	13331	304	18	49	162	35	Lipari	Gabellotto
Tramontana	31552		Bruker 5i	13451	289	15	47	161	36	Lipari	Gabellotto
Tramontana	31553		Bruker 5i	12563	296	14	48	153	34	Lipari	Gabellotto
Tramontana	31554		Bruker 5i	12714	300	16	47	162	38	Lipari	Gabellotto
Tramontana	31555		Bruker 5i	12517	292	15	45	155	33	Lipari	Gabellotto
Tramontana	31556		Bruker 5i	12796	287	13	48	168	34	Lipari	Gabellotto
Tramontana	31557		Bruker 5i	11705	277	14	44	131	30	Lipari	Gabellotto
Tramontana	31558		Bruker 5i	12408	291	17	46	158	36	Lipari	Gabellotto
Tramontana	31559		Bruker 5i	17206	279	20	48	161	41	Lipari	Gabellotto
Tramontana	31560		Bruker 5i	12976	288	18	49	157	37	Lipari	Gabellotto
Tramontana	31561		Bruker 5i	13064	301	16	44	155	33	Lipari	Gabellotto
Tramontana	31562		Bruker 5i	12396	291	14	48	155	35	Lipari	Gabellotto
Tramontana	31563		Bruker 5i	13068	265	14	41	148	36	Lipari	Gabellotto
Tramontana	31564		Bruker 5i	13875	303	18	54	171	37	Lipari	Gabellotto
Tramontana	31565		Bruker 5i	11649	281	14	47	152	32	Lipari	Gabellotto
Tramontana	31566		Bruker 5i	12855	297	17	46	155	34	Lipari	Gabellotto
Tramontana	31567		Bruker 5i	13723	306	17	47	163	39	Lipari	Gabellotto
Tramontana	31568		Bruker 5i	13700	292	17	46	155	32	Lipari	Gabellotto
Tramontana	31569		Bruker 5i	12899	283	14	47	155	36	Lipari	Gabellotto
Tramontana	31570		Bruker 5i	13539	313	18	53	167	36	Lipari	Gabellotto
Tramontana	31571		Bruker 5i	12700	290	14	47	156	32	Lipari	Gabellotto
Tramontana	31572		Bruker 5i	12462	299	14	46	160	35	Lipari	Gabellotto
Tramontana	31573		Bruker 5i	13727	298	15	46	157	36	Lipari	Gabellotto
Tramontana	31574		Bruker 5i	11650	264	13	45	146	31	Lipari	Gabellotto
Tramontana	31575		Bruker 5i	58177	185	8	141	1585	392	Pantelleria	Balata dei Turchi

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31576		Bruker 5i	12121	269	14	47	142	32	Lipari	Gabellotto
Tramontana	31577		Bruker 5i	12227	290	16	45	149	31	Lipari	Gabellotto
Tramontana	31578		Bruker 5i	11944	284	13	46	152	34	Lipari	Gabellotto
Tramontana	31579		Bruker 5i	11983	283	14	43	150	35	Lipari	Gabellotto
Tramontana	31580		Bruker 5i	12089	276	14	44	143	33	Lipari	Gabellotto
Tramontana	31581		Bruker 5i	11803	275	14	43	147	33	Lipari	Gabellotto
Tramontana	31582		Bruker 5i	13609	306	18	50	162	35	Lipari	Gabellotto
Tramontana	31583		Bruker 5i	13444	300	15	51	160	36	Lipari	Gabellotto
Tramontana	31584		Bruker 5i	13237	287	16	47	152	38	Lipari	Gabellotto
Tramontana	31585		Bruker 5i	13774	308	16	48	162	33	Lipari	Gabellotto
Tramontana	31586		Bruker 5i	15302	300	15	49	160	38	Lipari	Gabellotto
Tramontana	31587		Bruker 5i	12664	295	14	46	162	35	Lipari	Gabellotto
Tramontana	31588		Bruker 5i	70266	197	6	208	1854	426	Pantelleria	Balata dei Turchi
Tramontana	31589		Bruker 5i	12563	278	15	46	150	34	Lipari	Gabellotto
Tramontana	31590		Bruker 5i	12062	281	14	44	155	34	Lipari	Gabellotto
Tramontana	31591		Bruker 5i	13917	309	21	45	162	39	Lipari	Gabellotto
Tramontana	31592		Bruker 5i	11483	268	15	44	145	32	Lipari	Gabellotto
Tramontana	31593		Bruker 5i	13586	300	15	48	164	34	Lipari	Gabellotto
Tramontana	31594		Bruker 5i	60072	182	5	179	1625	380	Pantelleria	Balata dei Turchi
Tramontana	31595		Bruker 5i	13392	272	15	51	152	35	Lipari	Gabellotto
Tramontana	31596		Bruker 5i	11526	272	13	44	145	32	Lipari	Gabellotto
Tramontana	31597		Bruker 5i	13072	299	16	45	158	36	Lipari	Gabellotto
Tramontana	31598		Bruker 5i	12581	285	13	43	152	35	Lipari	Gabellotto
Tramontana	31599		Bruker 5i	13455	285	16	48	155	31	Lipari	Gabellotto
Tramontana	31600		Bruker 5i	12353	281	15	49	156	31	Lipari	Gabellotto
Tramontana	31601		Bruker 5i	12476	284	13	46	152	31	Lipari	Gabellotto
Tramontana	31602		Bruker 5i	12007	276	14	43	149	34	Lipari	Gabellotto
Tramontana	31603		Bruker 5i	12425	290	19	45	141	31	Lipari	Gabellotto
Tramontana	31604		Bruker 5i	11882	281	16	44	151	33	Lipari	Gabellotto
Tramontana	31605		Bruker 5i	14595	320	17	49	175	35	Lipari	Gabellotto
Tramontana	31606		Bruker 5i	13394	311	14	51	163	36	Lipari	Gabellotto
Tramontana	31607		Bruker 5i	13976	310	18	49	165	37	Lipari	Gabellotto
Tramontana	31608		Bruker 5i	12534	284	14	44	152	35	Lipari	Gabellotto
Tramontana	31609		Bruker 5i	13078	289	15	47	159	36	Lipari	Gabellotto
Tramontana	31610		Bruker 5i	12363	276	16	47	150	34	Lipari	Gabellotto
Tramontana	31611		Bruker 5i	12096	255	16	44	146	30	Lipari	Gabellotto
Tramontana	31612		Bruker 5i	12726	286	17	48	157	27	Lipari	Gabellotto
Tramontana	31613		Bruker 5i	12300	279	16	46	155	34	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31614		Bruker 5i	13889	297	16	47	166	36	Lipari	Gabellotto
Tramontana	31615		Bruker 5i	13629	294	15	50	165	35	Lipari	Gabellotto
Tramontana	31616		Bruker 5i	14318	329	19	58	182	39	Lipari	Gabellotto
Tramontana	31617		Bruker 5i	12728	282	15	47	153	37	Lipari	Gabellotto
Tramontana	31618		Bruker 5i	13318	300	16	45	162	36	Lipari	Gabellotto
Tramontana	31619		Bruker 5i	12517	290	16	48	161	34	Lipari	Gabellotto
Tramontana	31620		Bruker 5i	14777	326	17	49	176	38	Lipari	Gabellotto
Tramontana	31621		Bruker 5i	13398	299	18	51	166	38	Lipari	Gabellotto
Tramontana	31622		Bruker 5i	13708	298	17	48	141	35	Lipari	Gabellotto
Tramontana	31623		Bruker 5i	13042	288	15	49	138	34	Lipari	Gabellotto
Tramontana	31624		Bruker 5i	12200	278	15	43	150	33	Lipari	Gabellotto
Tramontana	31625		Bruker 5i	13453	310	16	51	158	37	Lipari	Gabellotto
Tramontana	31626		Bruker 5i	12882	282	15	44	152	32	Lipari	Gabellotto
Tramontana	31627		Bruker 5i	14205	321	18	50	170	36	Lipari	Gabellotto
Tramontana	31628		Bruker 5i	13861	305	14	48	162	33	Lipari	Gabellotto
Tramontana	31629		Bruker 5i	11866	278	11	47	140	33	Lipari	Gabellotto
Tramontana	31630		Bruker 5i	13732	309	15	52	163	38	Lipari	Gabellotto
Tramontana	31631		Bruker 5i	57798	181	4	172	1654	397	Pantelleria	Balata dei Turchi
Tramontana	31632		Bruker 5i	12572	286	15	47	164	27	Lipari	Gabellotto
Tramontana	31633		Bruker 5i	12711	293	16	46	155	35	Lipari	Gabellotto
Tramontana	31634		Bruker 5i	57088	178	6	162	1624	392	Pantelleria	Balata dei Turchi
Tramontana	31635		Bruker 5i	12322	276	13	45	143	33	Lipari	Gabellotto
Tramontana	31636		Bruker 5i	14283	293	16	50	153	33	Lipari	Gabellotto
Tramontana	31637		Bruker 5i	12213	280	13	44	152	35	Lipari	Gabellotto
Tramontana	31638		Bruker 5i	13105	296	17	48	166	38	Lipari	Gabellotto
Tramontana	31639		Bruker 5i	60604	189	5	172	1748	414	Pantelleria	Balata dei Turchi
Tramontana	31640		Bruker 5i	59368	188	5	166	1655	397	Pantelleria	Balata dei Turchi
Tramontana	31641		Bruker 5i	13432	289	20	46	148	34	Lipari	Gabellotto
Tramontana	31642		Bruker 5i	57582	176	4	160	1596	386	Pantelleria	Balata dei Turchi
Tramontana	31643		Bruker 5i	11810	266	15	46	151	31	Lipari	Gabellotto
Tramontana	31644		Bruker 5i	12271	280	16	45	154	35	Lipari	Gabellotto
Tramontana	31645		Bruker 5i	18664	355	22	49	176	35	Lipari	Gabellotto
Tramontana	31646		Bruker 5i	12389	291	14	46	162	37	Lipari	Gabellotto
Tramontana	31647		Bruker 5i	12272	279	15	50	152	35	Lipari	Gabellotto
Tramontana	31648		Bruker 5i	13534	280	15	46	154	34	Lipari	Gabellotto
Tramontana	31649		Bruker 5i	12805	283	15	52	153	34	Lipari	Gabellotto
Tramontana	31650		Bruker 5i	12861	295	13	43	152	35	Lipari	Gabellotto
Tramontana	31651		Bruker 5i	13368	300	16	51	160	37	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31652		Bruker 5i	14652	328	17	54	175	33	Lipari	Gabellotto
Tramontana	31653		Bruker 5i	12012	275	16	44	152	31	Lipari	Gabellotto
Tramontana	31654		Bruker 5i	14807	335	18	54	151	37	Lipari	Gabellotto
Tramontana	31655		Bruker 5i	12576	282	16	45	156	32	Lipari	Gabellotto
Tramontana	31656		Bruker 5i	14178	320	16	46	162	36	Lipari	Gabellotto
Tramontana	31657		Bruker 5i	13024	298	13	49	149	36	Lipari	Gabellotto
Tramontana	31658		Bruker 5i	12357	280	13	46	154	34	Lipari	Gabellotto
Tramontana	31659		Bruker 5i	12206	286	13	47	150	33	Lipari	Gabellotto
Tramontana	31660		Bruker 5i	13774	302	16	49	164	35	Lipari	Gabellotto
Tramontana	31661		Bruker 5i	12448	280	17	50	156	36	Lipari	Gabellotto
Tramontana	31662		Bruker 5i	13305	304	14	48	161	38	Lipari	Gabellotto
Tramontana	31663		Bruker 5i	12846	297	16	47	163	36	Lipari	Gabellotto
Tramontana	31664		Bruker 5i	65780	196	7	192	1735	411	Pantelleria	Balata dei Turchi
Tramontana	31665		Bruker 5i	67089	183	8	165	1648	379	Pantelleria	Balata dei Turchi
Tramontana	31666		Bruker 5i	63342	192	6	178	1620	388	Pantelleria	Balata dei Turchi
Tramontana	31667		Bruker 5i	12111	281	13	47	141	34	Lipari	Gabellotto
Tramontana	31668		Bruker 5i	13297	298	17	49	161	35	Lipari	Gabellotto
Tramontana	31669		Bruker 5i							not obsid.	
Tramontana	31670		Bruker 5i	13563	322	18	49	167	35	Lipari	Gabellotto
Tramontana	31671		Bruker 5i	15226	324	19	50	171	38	Lipari	Gabellotto
Tramontana	31672		Bruker 5i	13084	290	15	49	161	34	Lipari	Gabellotto
Tramontana	31673		Bruker 5i	13108	308	21	50	149	38	Lipari	Gabellotto
Tramontana	31674		Bruker 5i	13863	299	15	49	161	33	Lipari	Gabellotto
Tramontana	31675		Bruker 5i	13284	313	17	47	162	34	Lipari	Gabellotto
Tramontana	31676		Bruker 5i	13244	293	14	44	154	35	Lipari	Gabellotto
Tramontana	31677		Bruker 5i	15195	308	17	49	165	38	Lipari	Gabellotto
Tramontana	31678		Bruker 5i	13850	304	14	47	157	35	Lipari	Gabellotto
Tramontana	31679		Bruker 5i	12734	278	15	43	156	37	Lipari	Gabellotto
Tramontana	31680		Bruker 5i	12212	293	15	49	157	36	Lipari	Gabellotto
Tramontana	31681		Bruker 5i	12733	289	16	46	159	38	Lipari	Gabellotto
Tramontana	31682		Bruker 5i	63826	198	7	173	1753	419	Pantelleria	Balata dei Turchi
Tramontana	31683		Bruker 5i	65392	189	6	196	1694	404	Pantelleria	Balata dei Turchi
Tramontana	31684		Bruker 5i	13438	294	13	50	157	36	Lipari	Gabellotto
Tramontana	31685		Bruker 5i	12784	283	16	47	153	35	Lipari	Gabellotto
Tramontana	31686		Bruker 5i	12156	290	15	47	156	37	Lipari	Gabellotto
Tramontana	31687		Bruker 5i	12510	296	15	49	164	37	Lipari	Gabellotto
Tramontana	31688		Bruker 5i	14091	290	18	46	163	37	Lipari	Gabellotto
Tramontana	31689		Bruker 5i	13010	304	12	48	159	35	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31690		Bruker 5i	15200	326	19	55	173	34	Lipari	Gabellotto
Tramontana	31691		Bruker 5i	12128	272	13	49	152	33	Lipari	Gabellotto
Tramontana	31692		Bruker 5i	12751	286	17	48	153	33	Lipari	Gabellotto
Tramontana	31693		Bruker 5i	13097	293	18	46	156	32	Lipari	Gabellotto
Tramontana	31694		Bruker 5i	14443	305	18	49	147	36	Lipari	Gabellotto
Tramontana	31695		Bruker 5i	13120	304	14	53	176	33	Lipari	Gabellotto
Tramontana	31696		Bruker 5i	12863	297	14	51	164	36	Lipari	Gabellotto
Tramontana	31697		Bruker 5i	14672	287	23	50	160	34	Lipari	Gabellotto
Tramontana	31698		Bruker 5i	12709	304	13	48	158	32	Lipari	Gabellotto
Tramontana	31699		Bruker 5i	14026	303	17	51	170	36	Lipari	Gabellotto
Tramontana	31700		Bruker 5i	12392	298	12	49	152	34	Lipari	Gabellotto
Tramontana	31701		Bruker 5i	13167	291	15	46	158	34	Lipari	Gabellotto
Tramontana	31702		Bruker 5i	13231	303	15	52	165	32	Lipari	Gabellotto
Tramontana	31703		Bruker 5i	13104	287	17	45	148	35	Lipari	Gabellotto
Tramontana	31704		Bruker 5i	11868	285	16	45	153	35	Lipari	Gabellotto
Tramontana	31705		Bruker 5i	10480	252	12	41	136	32	Lipari	Gabellotto
Tramontana	31706		Bruker 5i	12616	309	16	49	162	37	Lipari	Gabellotto
Tramontana	31707		Bruker 5i	12359	290	16	47	157	36	Lipari	Gabellotto
Tramontana	31708		Bruker 5i	13918	289	14	47	156	34	Lipari	Gabellotto
Tramontana	31709		Bruker 5i	14031	313	23	51	152	35	Lipari	Gabellotto
Tramontana	31710		Bruker 5i	13639	298	17	50	163	40	Lipari	Gabellotto
Tramontana	31711		Bruker 5i	13306	308	16	50	163	38	Lipari	Gabellotto
Tramontana	31712		Bruker 5i	16495	357	23	51	155	37	Lipari	Gabellotto
Tramontana	31713		Bruker 5i	13366	312	19	49	143	36	Lipari	Gabellotto
Tramontana	31714		Bruker 5i	14152	323	18	51	159	36	Lipari	Gabellotto
Tramontana	31715		Bruker 5i	14053	305	17	48	137	34	Lipari	Gabellotto
Tramontana	31716		Bruker 5i	60475	187	6	181	1691	391	Pantelleria	Balata dei Turchi
Tramontana	31717		Bruker 5i	12880	289	16	51	157	36	Lipari	Gabellotto
Tramontana	31718		Bruker 5i	12560	279	16	50	147	35	Lipari	Gabellotto
Tramontana	31719		Bruker 5i	15791	348	17	53	191	41	Lipari	Gabellotto
Tramontana	31720		Bruker 5i	13629	317	16	51	166	30	Lipari	Gabellotto
Tramontana	31721		Bruker 5i	13554	309	16	48	169	34	Lipari	Gabellotto
Tramontana	31722		Bruker 5i	13533	305	19	52	165	38	Lipari	Gabellotto
Tramontana	31723		Bruker 5i	13471	297	16	44	151	36	Lipari	Gabellotto
Tramontana	31724		Bruker 5i	15718	296	19	52	169	34	Lipari	Gabellotto
Tramontana	31725		Bruker 5i	14025	312	16	51	166	38	Lipari	Gabellotto
Tramontana	31726		Bruker 5i	13280	310	16	49	162	37	Lipari	Gabellotto
Tramontana	31727		Bruker 5i	12513	288	14	48	155	34	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31728		Bruker 5i	15053	283	17	41	149	33	Lipari	Gabellotto
Tramontana	31729		Bruker 5i	61540	190	4	182	1629	398	Pantelleria	Balata dei Turchi
Tramontana	31730		Bruker 5i	13919	307	19	49	166	36	Lipari	Gabellotto
Tramontana	31731		Bruker 5i	13821	310	16	47	171	38	Lipari	Gabellotto
Tramontana	31732		Bruker 5i	13127	285	14	45	152	34	Lipari	Gabellotto
Tramontana	31733		Bruker 5i	14565	297	16	53	153	35	Lipari	Gabellotto
Tramontana	31734		Bruker 5i	13105	295	15	48	158	35	Lipari	Gabellotto
Tramontana	31735		Bruker 5i	14098	309	15	46	159	36	Lipari	Gabellotto
Tramontana	31736		Bruker 5i	14905	295	15	49	147	32	Lipari	Gabellotto
Tramontana	31737		Bruker 5i	13490	295	16	45	160	36	Lipari	Gabellotto
Tramontana	31738		Bruker 5i	15273	310	16	57	143	29	Lipari	Gabellotto
Tramontana	31739		Bruker 5i	14522	305	13	49	153	35	Lipari	Gabellotto
Tramontana	31740		Bruker 5i	12126	270	15	42	127	32	Lipari	Gabellotto
Tramontana	31741		Bruker 5i	14971	331	17	52	177	44	Lipari	Gabellotto
Tramontana	31742		Bruker 5i	13514	298	14	50	168	35	Lipari	Gabellotto
Tramontana	31743		Bruker 5i	13240	307	15	52	167	34	Lipari	Gabellotto
Tramontana	31744		Bruker 5i	13845	314	16	53	170	36	Lipari	Gabellotto
Tramontana	31745		Bruker 5i	16365	340	21	52	182	40	Lipari	Gabellotto
Tramontana	31746		Bruker 5i	13214	287	16	47	159	34	Lipari	Gabellotto
Tramontana	31747		Bruker 5i	13179	305	16	50	162	36	Lipari	Gabellotto
Tramontana	31748		Bruker 5i	13024	312	15	49	176	39	Lipari	Gabellotto
Tramontana	31749		Bruker 5i	13045	312	17	46	162	35	Lipari	Gabellotto
Tramontana	31750		Bruker 5i	13120	301	15	53	175	36	Lipari	Gabellotto
Tramontana	31751		Bruker 5i	63013	195	6	180	1778	430	Pantelleria	Balata dei Turchi
Tramontana	31752		Bruker 5i	12532	299	15	46	158	34	Lipari	Gabellotto
Tramontana	31753		Bruker 5i	13558	321	16	48	167	39	Lipari	Gabellotto
Tramontana	31754		Bruker 5i	14128	323	17	50	167	38	Lipari	Gabellotto
Tramontana	31755		Bruker 5i	14053	313	16	51	165	38	Lipari	Gabellotto
Tramontana	31756		Bruker 5i	13635	313	16	49	163	36	Lipari	Gabellotto
Tramontana	31757		Bruker 5i	14120	312	16	49	162	36	Lipari	Gabellotto
Tramontana	31758		Bruker 5i	13412	309	16	49	160	37	Lipari	Gabellotto
Tramontana	31759		Bruker 5i	15376	335	17	50	179	39	Lipari	Gabellotto
Tramontana	31760		Bruker 5i	15031	341	18	51	173	38	Lipari	Gabellotto
Tramontana	31761		Bruker 5i	63812	200	7	168	1730	415	Pantelleria	Balata dei Turchi
Tramontana	31762		Bruker 5i	11878	276	15	45	150	35	Lipari	Gabellotto
Tramontana	31763		Bruker 5i	13947	309	16	48	163	38	Lipari	Gabellotto
Tramontana	31764		Bruker 5i	14277	321	20	51	165	34	Lipari	Gabellotto
Tramontana	31765		Bruker 5i	13420	293	16	48	164	34	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31766		Bruker 5i	13212	290	15	49	154	34	Lipari	Gabellotto
Tramontana	31767		Bruker 5i	14362	298	16	51	167	39	Lipari	Gabellotto
Tramontana	31768		Bruker 5i	13747	307	17	50	166	39	Lipari	Gabellotto
Tramontana	31769		Bruker 5i	14003	304	16	51	150	32	Lipari	Gabellotto
Tramontana	31770		Bruker 5i	15619	324	17	46	172	37	Lipari	Gabellotto
Tramontana	31771		Bruker 5i	14275	324	17	49	166	35	Lipari	Gabellotto
Tramontana	31772		Bruker 5i	13831	301	18	50	164	35	Lipari	Gabellotto
Tramontana	31773		Bruker 5i	14521	313	16	44	159	35	Lipari	Gabellotto
Tramontana	31774		Bruker 5i	13294	303	16	52	155	33	Lipari	Gabellotto
Tramontana	31775		Bruker 5i	14148	306	16	48	171	33	Lipari	Gabellotto
Tramontana	31776		Bruker 5i	14312	316	17	61	172	36	Lipari	Gabellotto
Tramontana	31777		Bruker 5i	63300	180	6	174	1621	385	Pantelleria	Balata dei Turchi
Tramontana	31778		Bruker 5i	12704	284	15	46	154	35	Lipari	Gabellotto
Tramontana	31779		Bruker 5i	64791	193	6	163	1687	394	Pantelleria	Balata dei Turchi
Tramontana	31780		Bruker 5i	12882	299	15	48	161	34	Lipari	Gabellotto
Tramontana	31781		Bruker 5i	13897	292	14	49	161	33	Lipari	Gabellotto
Tramontana	31782		Bruker 5i	16122	348	18	46	166	36	Lipari	Gabellotto
Tramontana	31783		Bruker 5i	14131	320	17	46	172	30	Lipari	Gabellotto
Tramontana	31784		Bruker 5i	15299	313	19	50	162	36	Lipari	Gabellotto
Tramontana	31785		Bruker 5i	14345	309	17	53	169	37	Lipari	Gabellotto
Tramontana	31786		Bruker 5i	14121	306	17	53	165	38	Lipari	Gabellotto
Tramontana	31787		Bruker 5i	57796	176	6	161	1570	372	Pantelleria	Balata dei Turchi
Tramontana	31788		Bruker 5i	13882	308	13	49	160	36	Lipari	Gabellotto
Tramontana	31789		Bruker 5i	13770	313	15	54	159	38	Lipari	Gabellotto
Tramontana	31790		Bruker 5i	13156	310	16	51	162	36	Lipari	Gabellotto
Tramontana	31791		Bruker 5i	12845	267	15	44	145	33	Lipari	Gabellotto
Tramontana	31792		Bruker 5i	12845	267	15	44	145	33	Lipari	Gabellotto
Tramontana	31793		Bruker 5i	13453	298	15	49	156	37	Lipari	Gabellotto
Tramontana	31794		Bruker 5i	14214	294	25	44	154	27	Lipari	Gabellotto
Tramontana	31795		Bruker 5i	14728	315	17	50	165	38	Lipari	Gabellotto
Tramontana	31796		Bruker 5i	12224	279	14	44	153	32	Lipari	Gabellotto
Tramontana	31797		Bruker 5i	13674	284	14	50	152	31	Lipari	Gabellotto
Tramontana	31798		Bruker 5i	17508	320	20	51	167	37	Lipari	Gabellotto
Tramontana	31799		Bruker 5i	14249	321	14	51	172	39	Lipari	Gabellotto
Tramontana	31800		Bruker 5i	14474	317	19	54	168	34	Lipari	Gabellotto
Tramontana	31801		Bruker 5i	14675	322	20	46	161	31	Lipari	Gabellotto
Tramontana	31802		Bruker 5i	15015	321	25	53	175	37	Lipari	Gabellotto
Tramontana	31803		Bruker 5i	12470	274	14	45	149	32	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31804		Bruker 5i	14025	309	15	50	159	34	Lipari	Gabellotto
Tramontana	31805		Bruker 5i	13560	302	14	53	164	36	Lipari	Gabellotto
Tramontana	31806		Bruker 5i	16948	356	18	57	179	42	Lipari	Gabellotto
Tramontana	31807		Bruker 5i	73494	217	7	161	1819	418	Pantelleria	Balata dei Turchi
Tramontana	31808		Bruker 5i	12184	285	17	41	132	31	Lipari	Gabellotto
Tramontana	31809		Bruker 5i	13886	284	17	45	136	31	Lipari	Gabellotto
Tramontana	31810		Bruker 5i	15287	303	14	51	169	31	Lipari	Gabellotto
Tramontana	31811		Bruker 5i	14598	250	15	39	128	26	Lipari	Gabellotto
Tramontana	31812		Bruker 5i	12569	274	16	45	146	32	Lipari	Gabellotto
Tramontana	31813		Bruker 5i	14672	314	17	49	164	31	Lipari	Gabellotto
Tramontana	31814		Bruker 5i	14011	305	19	48	154	33	Lipari	Gabellotto
Tramontana	31815		Bruker 5i	13919	295	20	51	141	35	Lipari	Gabellotto
Tramontana	31816		Bruker 5i	12448	282	15	44	153	32	Lipari	Gabellotto
Tramontana	31817		Bruker 5i	13236	307	19	50	162	36	Lipari	Gabellotto
Tramontana	31818		Bruker 5i	12599	261	13	36	140	32	Lipari	Gabellotto
Tramontana	31819		Bruker 5i	13815	321	16	46	166	37	Lipari	Gabellotto
Tramontana	31820		Bruker 5i	14098	283	14	48	153	32	Lipari	Gabellotto
Tramontana	31821		Bruker 5i	14240	318	16	51	163	37	Lipari	Gabellotto
Tramontana	31822		Bruker 5i	13367	313	17	52	167	37	Lipari	Gabellotto
Tramontana	31823		Bruker 5i	14063	317	15	53	164	36	Lipari	Gabellotto
Tramontana	31824		Bruker 5i	14752	319	20	51	170	35	Lipari	Gabellotto
Tramontana	31825		Bruker 5i	13518	305	15	46	155	36	Lipari	Gabellotto
Tramontana	31826		Bruker 5i	13178	292	13	46	155	35	Lipari	Gabellotto
Tramontana	31827		Bruker 5i	12726	270	15	41	150	30	Lipari	Gabellotto
Tramontana	31828		Bruker 5i	56466	170	6	156	1536	370	Pantelleria	Balata dei Turchi
Tramontana	31829		Bruker 5i	62690	184	7	183	1580	384	Pantelleria	Balata dei Turchi
Tramontana	31830		Bruker 5i	12131	271	14	45	148	33	Lipari	Gabellotto
Tramontana	31831		Bruker 5i	14550	317	17	51	167	35	Lipari	Gabellotto
Tramontana	31832		Bruker 5i	13478	313	15	47	160	33	Lipari	Gabellotto
Tramontana	31833		Bruker 5i	12485	301	14	49	162	36	Lipari	Gabellotto
Tramontana	31834		Bruker 5i	14786	294	17	45	155	37	Lipari	Gabellotto
Tramontana	31835		Bruker 5i	12995	288	16	51	164	33	Lipari	Gabellotto
Tramontana	31836		Bruker 5i	55343	160	6	159	1406	347	Pantelleria	Balata dei Turchi
Tramontana	31837		Bruker 5i	15053	304	15	52	166	34	Lipari	Gabellotto
Tramontana	31838		Bruker 5i	15337	285	21	48	129	31	Lipari	Gabellotto
Tramontana	31839		Bruker 5i	12535	268	13	41	141	29	Lipari	Gabellotto
Tramontana	31840		Bruker 5i	12588	273	15	45	152	34	Lipari	Gabellotto
Tramontana	31841		Bruker 5i	15093	319	16	46	157	34	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana	31842		Bruker 5i	13541	299	17	51	163	36	Lipari	Gabellotto
Tramontana	31843		Bruker 5i	19340	314	23	53	181	38	Lipari	Gabellotto
Tramontana	31844		Bruker 5i	13524	295	15	44	148	36	Lipari	Gabellotto
Tramontana	31845		Bruker 5i	62269	187	7	180	1594	374	Pantelleria	Balata dei Turchi
Tramontana	31846		Bruker 5i	14073	293	15	51	160	37	Lipari	Gabellotto
Tramontana	31847		Bruker 5i	62709	190	8	185	1683	395	Pantelleria	Balata dei Turchi
Tramontana	31848		Bruker 5i	12989	295	14	51	164	35	Lipari	Gabellotto
Tramontana	31849		Bruker 5i	62298	114	2	92	944	218	Pantelleria	Lago di Venere 2
Tramontana	31850		Bruker 5i	13707	305	16	48	161	36	Lipari	Gabellotto
Tramontana	31851		Bruker 5i	12911	282	16	50	152	34	Lipari	Gabellotto
Tramontana	31852		Bruker 5i	13289	299	14	47	167	36	Lipari	Gabellotto
Tramontana	31853		Bruker 5i	13393	282	16	44	157	36	Lipari	Gabellotto
Tramontana	31854		Bruker 5i	13271	307	18	49	157	37	Lipari	Gabellotto
Tramontana	31855		Bruker 5i	13056	302	20	52	168	33	Lipari	Gabellotto
Tramontana	31856		Bruker 5i	12770	290	14	47	164	34	Lipari	Gabellotto
Tramontana	31857		Bruker 5i	13514	307	16	48	162	36	Lipari	Gabellotto
Tramontana	31858		Bruker 5i	15978	311	23	46	160	32	Lipari	Gabellotto
Tramontana	31859		Bruker 5i	14053	292	17	52	159	34	Lipari	Gabellotto
Tramontana	31860		Bruker 5i	13904	291	18	46	138	34	Lipari	Gabellotto
Tramontana	31861		Bruker 5i	14857	317	17	59	161	26	Lipari	Gabellotto
Tramontana	31862		Bruker 5i	12784	285	12	45	136	36	Lipari	Gabellotto
Tramontana	31863		Bruker 5i	15394	308	18	53	159	34	Lipari	Gabellotto
Tramontana	31864		Bruker 5i	13056	302	15	48	164	35	Lipari	Gabellotto
Tramontana	31865		Bruker 5i	14501	279	20	46	139	30	Lipari	Gabellotto
Tramontana	31866		Bruker 5i	15030	323	16	48	168	36	Lipari	Gabellotto
Tramontana	31867		Bruker 5i	15636	323	19	45	158	29	Lipari	Gabellotto
Tramontana	31868		Bruker 5i	12969	289	15	44	151	32	Lipari	Gabellotto
Tramontana	31869		Bruker 5i	15244	319	20	49	148	38	Lipari	Gabellotto
Tramontana	31870		Bruker 5i	16002	329	22	49	178	41	Lipari	Gabellotto
Tramontana	31871		Bruker 5i	14159	317	14	55	161	36	Lipari	Gabellotto
Tramontana	31872		Bruker 5i	14751	329	15	48	172	39	Lipari	Gabellotto
Tramontana	31873		Bruker 5i	17441	326	19	49	161	31	Lipari	Gabellotto
Tramontana	31874		Bruker 5i	14717	288	17	54	141	29	Lipari	Gabellotto
Tramontana	31875		Bruker 5i	13750	288	13	47	148	33	Lipari	Gabellotto
Tramontana	31876		Bruker 5i	13803	300	17	51	160	40	Lipari	Gabellotto
Tramontana Alta	28643	Ustica 1	Bruker III-SD	11575	276	18	44	170	36	Lipari	Gabellotto
Tramontana Alta	28644	Ustica 2	Bruker III-SD	11507	277	18	43	165	36	Lipari	Gabellotto
Tramontana Alta	28645	Ustica 3	Bruker III-SD	12398	279	20	37	161	36	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana Alta	28646	Ustica 4	Bruker III-SD	11258	272	18	41	159	38	Lipari	Gabellotto
Tramontana Alta	28647	Ustica 5	Bruker III-SD	11816	300	18	51	175	41	Lipari	Gabellotto
Tramontana Alta	28648	Ustica 6	Bruker III-SD	52245	163	12	160	1560	342	Pantelleria	Balata dei Turchi
Tramontana Alta	28649	Ustica 7	Bruker III-SD	12116	290	14	41	173	36	Lipari	Gabellotto
Tramontana Alta	28650	Ustica 8	Bruker III-SD	11572	277	17	49	163	33	Lipari	Gabellotto
Tramontana Alta	28688	Ustica 46	Bruker III-SD	11571	275	18	40	163	33	Lipari	Gabellotto
Tramontana Alta	28689	Ustica 47	Bruker III-SD	11447	276	21	45	168	35	Lipari	Gabellotto
Tramontana Alta	28690	Ustica 48	Bruker III-SD	11229	280	20	42	171	33	Lipari	Gabellotto
Tramontana Alta	28691	Ustica 49	Bruker III-SD	11257	274	17	40	165	35	Lipari	Gabellotto
Tramontana Alta	28692	Ustica 50	Bruker III-SD	10740	282	20	46	164	35	Lipari	Gabellotto
Tramontana Alta	28694	Ustica 52	Bruker III-SD	55885	182	13	178	1652	350	Pantelleria	Balata dei Turchi
Tramontana Alta	28695	Ustica 53	Bruker III-SD	11128	266	17	47	166	34	Lipari	Gabellotto
Tramontana Alta	28696	Ustica 54	Bruker III-SD	11162	290	20	42	169	38	Lipari	Gabellotto
Tramontana Alta	28697	Ustica 55	Bruker III-SD	11871	267	16	37	166	31	Lipari	Gabellotto
Tramontana Alta	28698	Ustica 56	Bruker III-SD	11324	297	18	41	169	36	Lipari	Gabellotto
Tramontana Alta	28699	Ustica 57	Bruker III-SD	55851	178	11	168	1664	366	Pantelleria	Balata dei Turchi
Tramontana Alta	28700	Ustica 58	Bruker III-SD	54140	169	11	177	1636	359	Pantelleria	Balata dei Turchi
Tramontana Alta	28701	Ustica 59	Bruker III-SD	11029	280	19	45	165	37	Lipari	Gabellotto
Tramontana Alta	28702	Ustica 60	Bruker III-SD	55809	178	13	167	1620	363	Pantelleria	Balata dei Turchi
Tramontana Alta	28703	Ustica 61	Bruker III-SD	54030	176	12	166	1626	363	Pantelleria	Balata dei Turchi
Tramontana Alta	28704	Ustica 62	Bruker III-SD	11548	287	19	37	163	37	Lipari	Gabellotto
Tramontana Alta	28705	Ustica 63	Bruker III-SD	11900	278	20	50	170	38	Lipari	Gabellotto
Tramontana Alta	28706	Ustica 64	Bruker III-SD	54663	184	12	165	1685	371	Pantelleria	Balata dei Turchi
Tramontana Alta	28707	Ustica 65	Bruker III-SD	54123	169	15	164	1576	354	Pantelleria	Balata dei Turchi
Tramontana Alta	28708	Ustica 66	Bruker III-SD	12600	321	22	49	180	37	Lipari	Gabellotto
Tramontana Alta	28709	Ustica 67	Bruker III-SD	11608	277	15	43	170	34	Lipari	Gabellotto
Tramontana Alta	28710	Ustica 68	Bruker III-SD	54479	171	10	162	1625	368	Pantelleria	Balata dei Turchi
Tramontana Alta	28711	Ustica 69	Bruker III-SD	11528	294	18	43	177	35	Lipari	Gabellotto
Tramontana Alta	28712	Ustica 70	Bruker III-SD	11001	257	22	48	168	35	Lipari	Gabellotto
Tramontana Alta	28713	Ustica 71	Bruker III-SD	11860	300	14	41	172	35	Lipari	Gabellotto
Tramontana Alta	28714	Ustica 72	Bruker III-SD	56866	184	12	177	1685	389	Pantelleria	Balata dei Turchi
Tramontana Alta	28715	Ustica 73	Bruker III-SD	12851	289	20	44	173	37	Lipari	Gabellotto
Tramontana Alta	28716	Ustica 74	Bruker III-SD	11384	266	18	46	167	33	Lipari	Gabellotto
Tramontana Alta	28717	Ustica 75	Bruker III-SD	11380	279	16	43	170	37	Lipari	Gabellotto
Tramontana Alta	28718	Ustica 76	Bruker III-SD	11952	287	20	42	173	37	Lipari	Gabellotto
Tramontana Alta	28719	Ustica 77	Bruker III-SD	11149	274	15	42	155	34	Lipari	Gabellotto
Tramontana Alta	28720	Ustica 78	Bruker III-SD	55517	181	10	179	1700	373	Pantelleria	Balata dei Turchi
Tramontana Alta	28841	Ustica 199	Bruker III-SD	13853	329	20	41	182	38	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana Alta	28842	Ustica 200	Bruker III-SD	11915	292	14	41	167	30	Lipari	Gabellotto
Tramontana Alta	28843	Ustica 201	Bruker III-SD	11415	287	13	42	165	33	Lipari	Gabellotto
Tramontana Alta	28844	Ustica 202	Bruker III-SD	55113	177	14	182	1652	374	Pantelleria	Balata dei Turchi
Tramontana Alta	28845	Ustica 203	Bruker III-SD	12204	288	19	38	162	36	Lipari	Gabellotto
Tramontana Alta	28846	Ustica 204	Bruker III-SD	12259	306	21	49	174	40	Lipari	Gabellotto
Tramontana Alta	28847	Ustica 205	Bruker III-SD	13995	291	21	41	172	34	Lipari	Gabellotto
Tramontana Alta	28848	Ustica 206	Bruker III-SD	12472	298	19	47	184	38	Lipari	Gabellotto
Tramontana Alta	28849	Ustica 207	Bruker III-SD	14787	308	23	45	184	36	Lipari	Gabellotto
Tramontana Alta	28850	Ustica 208	Bruker III-SD	11914	289	20	37	170	37	Lipari	Gabellotto
Tramontana Alta	28851	Ustica 209	Bruker III-SD	11997	295	19	52	181	34	Lipari	Gabellotto
Tramontana Alta	28852	Ustica 210	Bruker III-SD	14231	291	21	41	180	40	Lipari	Gabellotto
Tramontana Alta	28853	Ustica 211	Bruker III-SD	58599	187	14	173	1670	364	Pantelleria	Balata dei Turchi
Tramontana Alta	28854	Ustica 212	Bruker III-SD	13584	327	20	44	187	40	Lipari	Gabellotto
Tramontana Alta	28855	Ustica 213	Bruker III-SD	13906	296	18	51	188	39	Lipari	Gabellotto
Tramontana Alta	28856	Ustica 214	Bruker III-SD	13640	347	20	50	188	35	Lipari	Gabellotto
Tramontana Alta	28857	Ustica 215	Bruker III-SD	13560	327	19	46	191	37	Lipari	Gabellotto
Tramontana Alta	28858	Ustica 216	Bruker III-SD	12452	312	23	41	173	35	Lipari	Gabellotto
Tramontana Alta	28859	Ustica 217	Bruker III-SD	15811	346	22	46	194	46	Lipari	Gabellotto
Tramontana Alta	28860	Ustica 218	Bruker III-SD	62118	185	14	196	1795	384	Pantelleria	Balata dei Turchi
Tramontana Alta	28861	Ustica 219	Bruker III-SD	13219	321	20	48	176	35	Lipari	Gabellotto
Tramontana Alta	28862	Ustica 220	Bruker III-SD	15221	383	21	48	186	48	Lipari	Gabellotto
Tramontana Alta	28863	Ustica 221	Bruker III-SD	58238	186	16	182	1714	378	Pantelleria	Balata dei Turchi
Tramontana Alta	28864	Ustica 222	Bruker III-SD	58598	188	13	193	1766	389	Pantelleria	Balata dei Turchi
Tramontana Alta	28865	Ustica 223	Bruker III-SD	13850	308	18	55	178	38	Lipari	Gabellotto
Tramontana Alta	28866	Ustica 224	Bruker III-SD	14344	313	21	54	178	33	Lipari	Gabellotto
Tramontana Alta	28867	Ustica 225	Bruker III-SD	11703	286	17	44	173	33	Lipari	Gabellotto
Tramontana Alta	28868	Ustica 226	Bruker III-SD	10810	252	14	40	150	34	Lipari	Gabellotto
Tramontana Alta	28869	Ustica 227	Bruker III-SD	11492	292	18	38	169	34	Lipari	Gabellotto
Tramontana Alta	28870	Ustica 228	Bruker III-SD	10831	261	16	43	150	31	Lipari	Gabellotto
Tramontana Alta	28871	Ustica 229	Bruker III-SD	12085	274	22	39	166	32	Lipari	Gabellotto
Tramontana Alta	28872	Ustica 230	Bruker III-SD	11145	289	17	40	166	37	Lipari	Gabellotto
Tramontana Alta	28873	Ustica 231	Bruker III-SD	11877	273	21	46	170	35	Lipari	Gabellotto
Tramontana Alta	28874	Ustica 232	Bruker III-SD	12089	289	16	40	180	38	Lipari	Gabellotto
Tramontana Alta	28875	Ustica 233	Bruker III-SD	12365	298	16	44	168	33	Lipari	Gabellotto
Tramontana Alta	28876	Ustica 234	Bruker III-SD	11217	298	15	43	171	33	Lipari	Gabellotto
Tramontana Alta	28877	Ustica 235	Bruker III-SD	13596	304	23	49	167	35	Lipari	Gabellotto
Tramontana Alta	28878	Ustica 236	Bruker III-SD	11371	276	20	44	166	36	Lipari	Gabellotto
Tramontana Alta	28879	Ustica 237	Bruker III-SD	11836	261	15	45	170	40	Lipari	Gabellotto

Site	USF #	Cat. #	pXRF	Fe	Rb	Sr	Y	Zr	Nb	Source	Subsource
Tramontana Alta	28880	Ustica 238	Bruker III-SD	12643	323	15	51	196	40	Lipari	Gabellotto
Tramontana Alta	28881	Ustica 239	Bruker III-SD	65213	191	14	175	1742	387	Pantelleria	Balata dei Turchi
Tramontana Alta	28882	Ustica 240	Bruker III-SD	12857	329	16	43	183	35	Lipari	Gabellotto
Tramontana Alta	28883	Ustica 241	Bruker III-SD	56272	186	15	172	1642	371	Pantelleria	Balata dei Turchi
Tramontana Alta	28884	Ustica 242	Bruker III-SD	13643	299	22	45	174	36	Lipari	Gabellotto
Tramontana Alta	28885	Ustica 243	Bruker III-SD	56625	180	13	186	1711	360	Pantelleria	Balata dei Turchi
Tramontana Alta	28886	Ustica 244	Bruker III-SD	12023	293	21	45	172	36	Lipari	Gabellotto
Tramontana Alta	28887	Ustica 245	Bruker III-SD	13494	303	22	50	181	38	Lipari	Gabellotto
Tramontana Alta	28888	Ustica 246	Bruker III-SD	52436	166	14	151	1526	331	Pantelleria	Balata dei Turchi
Tramontana Alta	28889	Ustica 247	Bruker III-SD	12350	273	18	39	159	35	Lipari	Gabellotto
Tramontana Alta	28890	Ustica 248	Bruker III-SD	12083	300	18	38	174	32	Lipari	Gabellotto
Tramontana Alta	28891	Ustica 249	Bruker III-SD	11881	289	17	40	174	32	Lipari	Gabellotto
Tramontana Alta	28892	Ustica 250	Bruker III-SD	12365	293	19	45	186	40	Lipari	Gabellotto
Tramontana Alta	28893	Ustica 251	Bruker III-SD	13944	357	22	48	197	44	Lipari	Gabellotto
Tramontana Alta	28894	Ustica 252	Bruker III-SD	13176	313	19	36	180	37	Lipari	Gabellotto
Tramontana Alta	28895	Ustica 253	Bruker III-SD	16213	365	21	48	209	39	Lipari	Gabellotto
Tramontana Alta	28896	Ustica 254	Bruker III-SD	13869	317	19	43	178	33	Lipari	Gabellotto
Tramontana Alta	28897	Ustica 255	Bruker III-SD	51596	161	14	143	1333	297	Pantelleria	Balata dei Turchi
Tramontana Alta	28898	Ustica 256	Bruker III-SD	11116	282	17	39	168	36	Lipari	Gabellotto
Tramontana Alta	28899	Ustica 257	Bruker III-SD	57754	201	10	176	1686	359	Pantelleria	Balata dei Turchi
Tramontana Alta	28900	Ustica 258	Bruker III-SD	52546	173	13	168	1628	346	Pantelleria	Balata dei Turchi
Tramontana Alta	28901	Ustica 259	Bruker III-SD	11341	270	15	46	167	38	Lipari	Gabellotto
Tramontana Alta	28902	Ustica 260	Bruker III-SD	11167	284	16	48	167	39	Lipari	Gabellotto
Tramontana Alta	28903	Ustica 261	Bruker III-SD	11891	287	19	43	175	32	Lipari	Gabellotto
Tramontana Alta	28904	Ustica 262	Bruker III-SD	9716	249	19	39	155	28	Lipari	Gabellotto
Tramontana Alta	28905	Ustica 263	Bruker III-SD	11872	294	15	42	160	36	Lipari	Gabellotto
Tramontana Alta	28906	Ustica 264	Bruker III-SD	12013	322	18	47	169	37	Lipari	Gabellotto
Tramontana Alta	28907	Ustica 265	Bruker III-SD	54494	188	11	177	1683	361	Pantelleria	Balata dei Turchi
Tramontana Alta	28908	Ustica 266	Bruker III-SD	11739	271	23	49	180	41	Lipari	Gabellotto
Tramontana Alta	28909	Ustica 267	Bruker III-SD	12782	294	21	46	193	37	Lipari	Gabellotto