

# Appendix 21 - Cultural Heritage Baseline Study Environmental and Social Impact Assessment Yaoure Gold Project, Côte d'Ivoire






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## SUMMARY

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Amara Mining Cote d'Ivoire Sarl carries out mining exploration in Bouaflé Department, at 6 km West from dam Kossou with the aim to commence with exploitation in 2016. For this purpose, an archaeological impact assessment and a cultural heritage study of the area was commissioned to meet national and international requirements for Environmental and Social Impact Assessment for the management and preservation of the cultural heritage.

Approach method includes an investigation relating to the confirmation of sacred sites mapped by the company, using a questionnaire in five (5) villages affected by the project and a pedestrian survey to make direct observations on the field in order to locate potential archaeological sites with the GPS.

The investigations that were carried out provided significant results on archaeological and cultural heritage.

Archaeologically, the presence of relics, witnessing various periods of ancient occupations, are present in the exploration area. However, almost all of these objects are taken out of their context. Furthermore, a Neolithic rock polisher was located in a sector (TMF 3) destined to receive alternatively the waste of the future gold mining. Another alternative area of rejection (TMF 2) also provided a ceramic site which state of conservation still offers possible archaeological dig.

As a cultural heritage, inventory of cemeteries and sacred forests carried out by Amara Mining Cote d'Ivoire Sarl has been evaluated, allowing to validate the map of sacred sites produced with the relevant communities.

However, these sites will be potentially subject to relocation because of future mining operations. In this same context, the destruction of some archaeological objects which have been highlighted by this study is possible. The construction of infrastructure and the different excavations works could disturb the stratigraphic structure of the areas not yet destroyed by the activity of gold panning. Otherwise, in Côte d'Ivoire, the texts relating to the legal provisions on preventive archaeological dig are not clearly defined.

It is therefore necessary to refer to the international regulation on cultural heritage management, including the convention for the safeguarding of the intangible cultural heritage, signed in Paris on October 17, 2003.

**KEY WORDS:** Kossou, mining, cultural heritage, archaeological site, disturbed site, slag, ceramic.

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## 1.0 INTRODUCTION

Amara Mining Cote d'Ivoire Sarl, has been awarded a mining research permit by the Ivorian Government. Amara has initiated the study of different impacts to meet the requirements of the feasibility of the operation for its mining site in Bouaflé Department.

The exploration site is located at 6 km West from Kossou dam and is divided into thirteen (13) sectors. There are:

- Four (4) areas of discharge of the mining residues, referred to as TMF (TMF1, TMF2, TMF3 and TMF4);
- Two (2) areas for the rejection of waste rock called sectors of the WASTES (waste 1 and waste 2);
- Two (2) areas for construction of the process plants or PLANT (plant 1 and plant 2);
- The mine pit referred to as, the PIT area;
- The area reserved for depositing the ore, the ROM PAD;
- The area of the ore zone covered by tightening polls, called PIT INFILL;
- The area of waste rock area covered by tightening polls, the WASTE INFILL;
- And the sector for dwellings or ACCOMMODATION.

All these sectors are the study area.

## 1.1 Study Area

The analysis of the study area will present the geographical and geological frameworks.

Located at 260 km Northwest from the capital Abidjan, Angovia is part of Marahoué region specifically Bouaflé Department.

Geographically, Angovia is located in the intermediate zone between the forest and the savannah. The vegetation framework is characterized by the entanglement of shrub savannah and generally, secondary forest areas. The region is indeed straddling on the boundary between the humid dense forest and the Sudano-Guinean savannah. The climate is governed by the alternation of the seasons of rain and dry seasons by different regimes of water bodies (especially the Bandama river). The combination of these influences defines three seasons:

- A dry season, from January to April, with significant evaporation, temperatures reaching the highest levels;
- A rainy season (May to August), dominated by the regime of the forest streams with very low temperatures;
- A season of floods (September-December), during which all the system is under the influence of the Bandama with its Sahelian regime and the temperatures go back from the month of October. The flow of the Bandama reached 1 400 m<sup>3</sup>/s, the maximum level in the month of October, the average value around 400m<sup>3</sup>/s.

Furthermore, Angovia belongs to the series of reliefs, sometimes referred to as chain Baoulé. It corresponds to a low system of wrinkles and due to mainly slate material, with Greenstone hills and quartzite. More generally, this relief extends from Mount Kokumbo Southwest, until Fetekro Northeast. A special place is made to tabular reliefs, witnesses of the most ancient erosion surfaces, such as Orumbo-Boka, mount Dido, Kokumbo, Blaffo-Darnell, Yaoure main summits.

These aspects lead to approach the geology which as the physical environment is that of a wider region.

Angovia fits into a peneplain built on granite and laterite formations with low elevations, between 200 to 300 meters increasing as one moves northwards. The general movement fits perfectly the birrimian direction and offers a range of more or less important heights, isolated or grouped in alignments, sometimes fairly well connected to the peneplain, sometimes also surrounded by armoured glacis. A massive armor, thick, sometimes bauxitic is the upper table, sometimes horizontal, sometimes inclined.

The study of the cultural heritage and archaeological patrimony in this locality, targets several objectives.

## 1.2 Objectives of the Study

The work on the ground, from 4 - 18 February 2015, aimed at:

- Undertaking an itinerant survey of all sectors of the extension of the mining sector;
- Establishing a map of the locations of the heritage and archaeological remains within the exploration licence area;
- Estimate the importance of the archaeological sites;
- Making recommendations for prevention and possible protection of the archaeological finds highlighted on the study area of the mining permit;
- Advocate additional work for an intensive study of possible archaeological sites, if necessary;
- Confirm the map of sacred sites spread over the study area.

## 1.3 Documentary Results

Before starting the field work itself, the collection of written documents was undertaken. They helped to determine the theoretical basis and identify the human and natural study frameworks.

KOFFI Sylvain's work on the carved stones of Gohitafla provides the frame of reference for the methodological approach to the archaeological survey of the study area.

The physical and geological survey of the area of inquiry has been defined according to the research of AVENARD<sup>1</sup> who has long studied the natural environment of Côte d'Ivoire. This study was supplemented by data from ZAMBLE Bi You<sup>2</sup> presenting the geographical setting, the natural environment and the occupation history of Bouafle.

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<sup>1</sup> AVENARD (J.M) et AL, le milieu naturel de la Côte-d'Ivoire, éd ORSTOM, Paris, 1974, 391p.

<sup>2</sup> ZAMBLE BI (Y.J.), «Bouafle des origines à 1936 », in Revue Ivoirienne d'Histoire, N°2, Abidjan, EDUCI, 2003, pp. 40-58

As for KOUAO-BIOT<sup>3</sup>, she raises up the legal deficiencies and presents the problem of the management of the archaeological sites threatened with destruction in Côte d'Ivoire. Since then, the question of the legal requirements for management of the cultural heritage still remains in Côte d'Ivoire.

## 1.4 Legal Requirements

In Côte d'Ivoire, the texts relating to the management of the cultural heritage are still elusive on the protection of archaeological sites. Act No. 87-806 of 28 July 1987 on the protection of cultural heritage, indicates the obligation to inform the departments of Cultural Affairs and Mines in the event of archaeological sites discovery. However, the provisions of preventive excavations, imposing an obligation to conduct archaeological research upstream of any project that may result in a degradation of the soil, are not mentioned therein.

In addition, Act No. 96-766 of 3 October 1996 establishing the Environment Code of, article 2, points out the need to protect floors, basements, sites, landscapes and national monuments. Clarification not having been made on the types of sites and implementation means of protection, it is necessary to adhere to the international provisions related to the management of the heritage under Yaoure project. In this context, the Convention for the safeguarding of the intangible cultural heritage, adopted in Paris on 17 October 2003, will constitute the legal basis for the legal requirements of the study of archaeological sites and cultural heritage of the exploration permit of Amara Mining Cote d'Ivoire Sarl.

## 1.5 Report Structure

This report is structured around two areas that allow to identify the content of the cultural heritage within the exploration permit.

The first is related to the archaeological aspect and the component shows all the archaeological sites and the state of their conservation. In this part, we present the data from the surveys carried out in the sectors identified by Amara Mining Côte d'Ivoire SARL which are: the tailings pond areas (TMF), waste rock deposit platforms (wastes) and finally the sectors of the ROM pad 1, accommodation, waste infill, treatment plant (plant 1 and 2).

The second area is studying the sacred sites. It is firstly, to present the investigations result enabling to validate inventory of cemeteries and sacred forests and, secondly, to apprehend the removable or non-removable nature of these sites.

Achieve these results, requires an approach method for the land to be clearly developed.

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<sup>3</sup> KOUAO-BIOT B., «Stratégies pour la sauvegarde des sites en danger : les cas de Fanfala et de Gohitafla (Côte-d'Ivoire)» : 383-390, in BAZZANA A. et al. (dir.), 2004, Du nord au sud du Sahara : 50 ans d'archéologie française en Afrique de l'Ouest et au Maghreb : bilan et perspectives. [Actes du colloque, Paris, 13-14 mai 2002], Edition Sépia, Paris, 446p.



## 2.0 METHODOLOGY

The field approach takes into account the two dimensions of the study: the cultural heritage and the actual archaeological study.

### 2.1 Archaeological Exploration

Archaeological exploration is an important step in the process of gathering information on the ground. It allows to identify traces of microstructures, anthropogenic structures and the sufficiently representative remains of historical relics, testifying the former occupations.

The geographic scope of the study is marked by an important vegetation cover that prevents a good view. The technique of a walk over exploration is justified. It is the most classical exploration techniques. It is to walk on the field and to make comments on the visible traces on the ground. Various artefacts (shreds of pottery, lithic objects, building materials, pieces of metal, archaeological objects, etc.) are revealed either by the natural evolution of the ground, ploughing during agricultural work.

Added to this phase of exploration, is the oral investigation to confirm the taking into account of sacred sites mapped by Amara Mining Côte d'Ivoire SARL. A questionnaire was used to investigate two categories of populations from the five (5) villages<sup>4</sup> located on the exploration licence: villages' populations and the Community Advisory Committee (C.A.C)<sup>5</sup>.

### 2.2 Data Collection Period and scope of the Study

The period of the dry season is favouring the walking exploration technique, thus justifying the choice of the date from 4 – 18 February 2015 to study the site of the exploration permit of Amara Mining Côte d'Ivoire SARL.

In total, thirteen (13) areas identified by this company were surveyed:

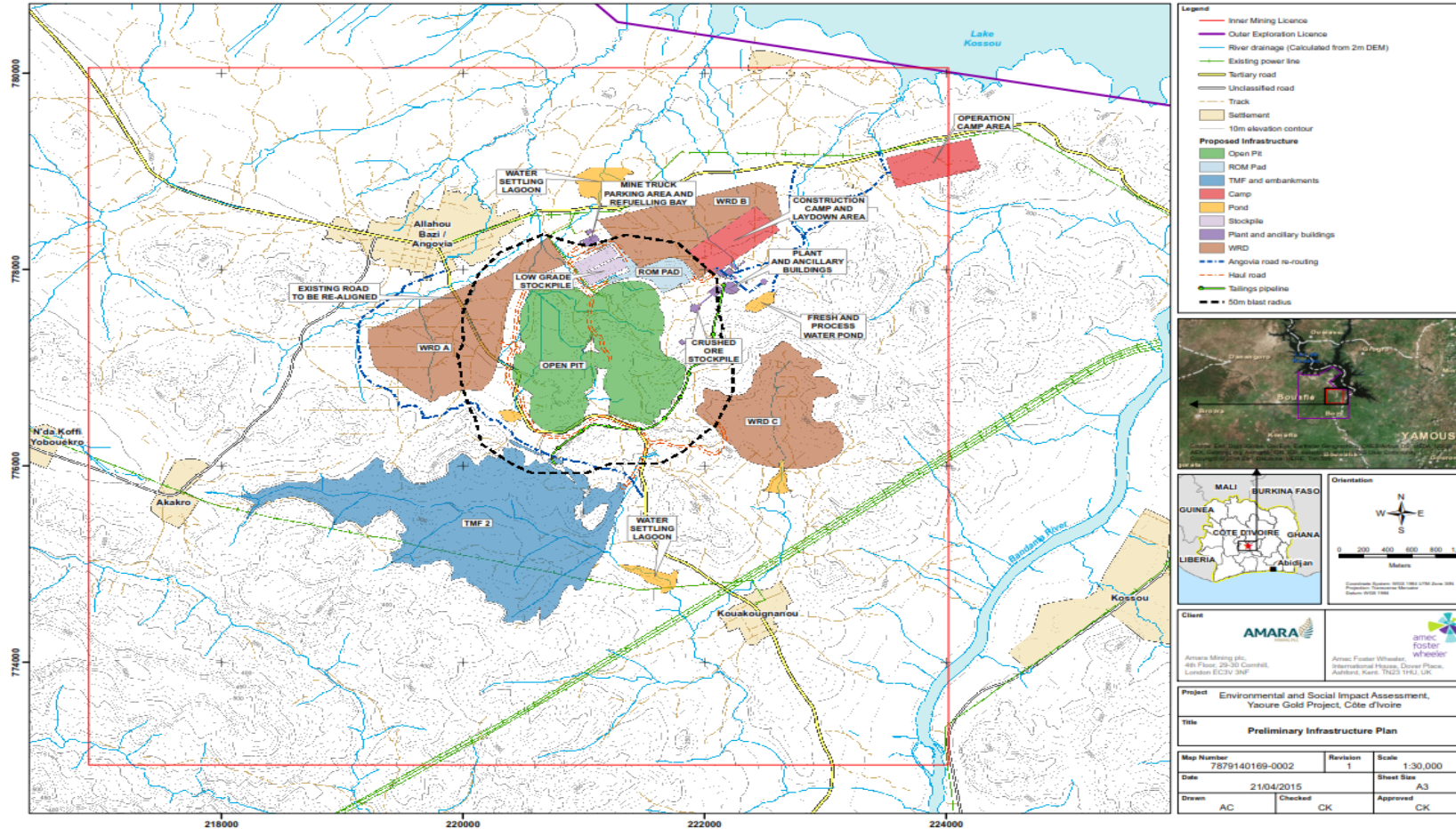
- Four (4) options of area of discharge of ore treatment waste, referred to as TMF (TMF1, TMF2, TMF3 and TMF4);
- Two (2) areas destined for the rejection of the waste rock referred to as sectors of the WASTES (waste 1 and waste 2);
- Two (2) areas destined process plants or PLANT (plant 1 and plant 2);
- The mine pit or the PIT;
- The area reserved for the dumping of the ore or ROM PAD;
- The ore zone sector covered by tightening polls, or PIT INFILL;
- The area of waste rock area covered by tightening polls, or WASTE INFILL;
- The sector destined to the dwellings or ACCOMMODATION (see map 2-1: area of planned mining infrastructures of the Yaoure gold project).

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<sup>4</sup> The five (5) villages that are on the permit of Amara Mining Côte d'Ivoire SARL are: Angovia, Allahou-Bazi, Akakro, Kouakougnanou, and N'da-Koffi Yobouékro.

<sup>5</sup> The Community Advisory Committee is a village body responsible for ensuring the interests of the populations of the five (5) localities on the permit of Amara Mining Côte d'Ivoire SARL.

Map 2-1: Area of planned mining infrastructures of the gold project



The exploration equipment consists in a location "GARMIN" GPS, a compass, a decametre, a camera for photographs and a map of the study area.

## **2.3 Sampling Methodology**

### **2.3.1 Sampling of the Remains**

Sampling of the remains are done according to the criterion of representativeness of the types seen on different sites.

- Regarding slags, two types from the ancient metallurgy of iron were collected: a casting slag and a spongy slag;
- Collected pottery fragments contain necklines, and body elements fragments;
- The two discovered polished hatchets were collected.

### **2.3.2 Sampling of Surveyed Populations**

The five (5) villages located on the exploration site and close to the future operating area were surveyed for four (4) days.

The target population of the (5) five villages, were the:

- Guardians of the sacred sites of each village;
- Notable of each village;
- Village leaders.

At the level of the Community Advisory Committee (C. A. C.), one representative per village has been consulted giving five (5) members.

The theoretical and methodological framework being elucidated, it suits to deliver the results of the investigations.

### 3.0 RESULTS

The presentation of the results will highlight the archaeological observations, specifying the heritage value of the sites and the state of conservation. We will be revealing next, the results of the survey of confirmation of sacred sites.

#### 3.1 Results of the Archaeological Aspect of the Study

This first part of the presentation of the results will exclusively present archaeological data from sectors that have been surveyed.

##### 3.1.1 Archaeological Data in the quarry space (or PIT)

Surveys carried out within the quarry (or PIT) provided no archaeological structure. However, in the immediate vicinity, to the East and precisely to the Northeast and South, remains were discovered.

In the South, fragments of ceramics appeared. Some fragments surfaced because of gold panning activity (see Photo 3-1) which wells disrupt archaeological sites.

**Photo 3-1: Ceramic Extracted from the Gold Panning Well at about 2.50 m deep**



07/ 02/ 2015  
GPS Coordinates 30 N x= 221 287 ; Y = 776 367

To the East of the PIT, three types of remains are observed:

- Fragments of ceramics (see photo 3-2);
- A broken polished hatchet (see photo 3-4);
- A nozzle fragment associated with a ceramic fragment (see photo 3-3).

These remains have been revealed by the opening of a road work: they are therefore not in place. The revamped ground, can no longer allow to carry out archaeological excavations on this space.

**Photo 3-2: Ceramic Fragment**



05 / 02 /2015  
Coord. GPS 30 N x= 221 704 ; y = 777 468

**Photo 3-3: Fragments of Ceramic and Nozzle**



06 / 02 /2015  
Coord. GPS 30 N x= 2221 583 ; y=777 563

**Photo 3-4: Polished Hatchet**



06 / 02 /2015  
Coord. GPS 30 N x= 221 609; y =777 535

To the Northeast of the PIT, slag (see photo 3-5) are scattered on a site of about 600 m<sup>2</sup> on which stands a cocoa plantation. Gold panning is performed resulting in a disruption of the archaeological ground. In this context, the remains observed are no longer in place.

**Photo 3-5: The Ancient Metallurgy of Iron Slag**

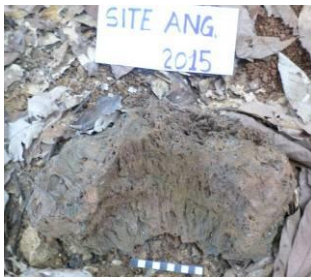
07/ 02/ 2015



Coord. GPS 30 N  
x=221 474; y=777 580



Coord. GPS 30 N  
x=221 516 ; y=777 555



Coord. GPS 30 N  
x=221 541; y=777 544







Coord. GPS 30 N  
x=221 541; y=777 282

### 3.1.2 Archaeological observations in the ore zone during the tightening polls (PIT INFILL)

The sector PIT INFILL delivers archaeological remains: fragments of pottery (see photos 3-6 and 3-7) as well as the slag of iron metallurgy (photos 3-8 and 3-9).

On this site, the pottery fragments are sometimes found in the walls of the wells of gold panning (Cf.), sometimes in a context where the ground is redesigned (see photo 3-7).

<p><b>Photo 3-6: Pottery fragment in the wall of a well for traditional gold ore extraction</b></p>  <p>05 / 02 / 2015 Coord. GPS 30 N x= 221 949; Y= 777 434</p>	<p><b>Photo 3-7: Pottery fragments scattered (the ground is revamped)</b></p>  <p>05 / 02 / 2015 Coord. GPS 30 N x = 221 977 ; y 777 405</p>
<p><b>Photo 3-8: Unearthed Slag</b></p>  <p>05 / 02 / 2015 Coord. GPS 30 N x= 222 148; Y= 0777 836</p>	<p><b>Photo 3-9: Unearthed Slag</b></p>  <p>05 / 02 / 2015 Coord. GPS 30 N x= 0222 949; Y= 0777 434</p>

### 3.1.3 Exploration on Sites in option of tailings (TMF: Tailings Management Facility)

Out of the 4 sectors that constitute the TMF, only 2 delivered archaeological information: TMF 2 and TMF 3.

Located in a large Valley, TMF 2 presents an important plant cover (forest area). An intense activity of artisanal gold mining takes place mainly in its eastern part. See Photo 3-10).

**Photo 3-10: Gold digging wells on TMF 2**



09/02/2015  
Coord. GPS 30 N x= 220 000; Y= 774 200

To the Southwest of TMF 2, lies the old cemetery, former site of the village Kouakougnanou previously called Clonou (before the Second World War). Near in its western part, a ceramic site (see Photo 11) was delimited by GPS survey (UTM 30 N).

The delimited site features on the surface of the ceramic fragments unevenly distributed. At the coordinate (x 0220 205; y 0775 058) is a strong concentration of these fragments. (See Photo 3-12).

**Photo 3-11: General View of the Ceramic Site of TMF2**

**Photo 3-12: The Surface Ceramic Fragments on the site of TMF2**



09 / 02/2015  
Coord. GPS 30N x = 0220 205 ; y = 0775 058

09 / 02/2015  
Coord. GPS 30N x = 0220 205 ; y = 0775 058

**Table 3-1: Delimitation of the Ceramic Site of TMF 2**

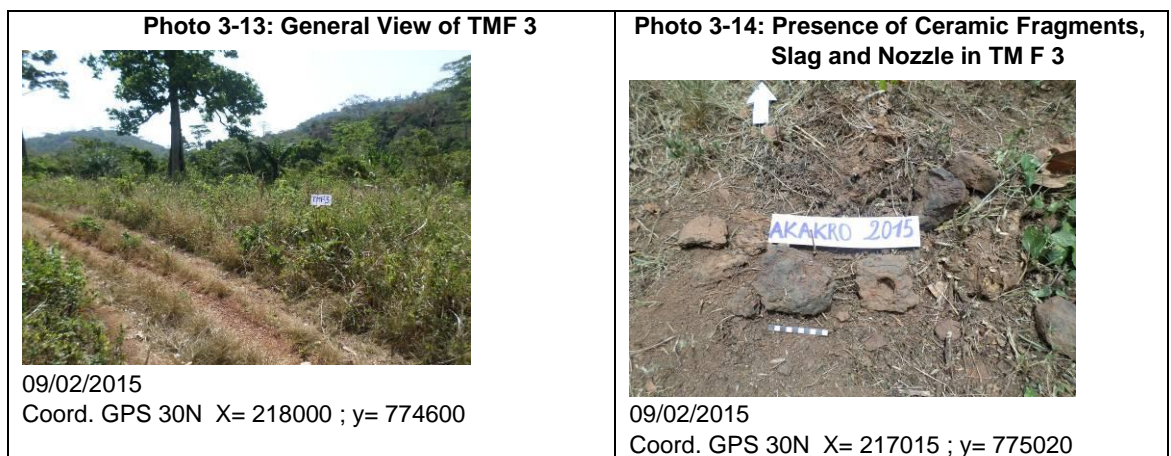
Marking points with GPS	GPS coordinates for the ceramic site UTM 30 N
A	x = 220 234 ; Y = 775 034
B	x = 220 138 ; Y = 775 041
C	x = 220 166 ; Y = 775 051
D	x= 220 145 ; Y = 775 010
E	x = 220 184 ; Y = 774 988

This ceramic presents some archaeological interest. Located between the sacred forest and the cemetery, it offers undisturbed deep soil. The massive presence of ceramic shads across its surface invite to an archaeological diagnosis that will enable collect archaeological documents in depth.

As well as TMF 2, TMF 3 presents archaeological interest, by virtue of the data it delivers.

### 3.1.4 Archaeological Data of TMF 3

Located in the South of the village Akakro, TMF 3 is a Valley area. Vestiges of the ancient iron metallurgy and ceramic fragments are noticeable on the northern side of the Valley. These remains consist of slag, a fragment of tunnel ventilation, and decorated pottery fragments (see Photo 3-14).



On the southern flank of the Valley on the site of TMF3, a block of basalt rock bearing traces of polishing of prehistoric tools (see Photo 3-15) is in place. Visibly degraded the rock seems to have been destined for extended use over a long period.

Polishers are trademarks which testify the manifestation of the Neolithic. They were indeed used to hard polishing such as quartzite, flint and other rocks.



**Photo 3-15: Polishers Site**



09/ 02 / 2015  
Coord. GPS 30N X=217352; y=774511

In total, three types of cultural events occur on the site of the TMF3: stone polishing, metallurgical production and pottery.

Compared to the TMF, all sectors meant for waste rock deposits (Wastes) have not provided archaeological relic. On the two Wastes to accommodate the waste rock of the mining operation, only the waste 2 yielded archaeological objects.

### 3.1.5 Archaeological Data of Waste 2

WASTE 2 ground is very disturbed by the gold panners. Accordingly, archaeological sites are completely destroyed due to the revamped layers and the observed archaeological structures.

<p><b>Photo 3-16: Gold Digging Wells</b></p> <p>14/02/2015 Coord. GPS 30 N x= 222225 ; y=778 180</p>	<p><b>Photo 3-17: Ceramic Fragments Scattered on Waste 2 in the Cuttings of Gold Panning</b></p> <p>14/02/2015 Coord. GPS 30 N x= 222227 ; y=778186</p>
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Ceramic fragments, necklines, sometimes decorated fragments (See Photo 3-17.), ancient iron metallurgy slag (See Photo 3-16) are found in the cuttings of gold digging wells.

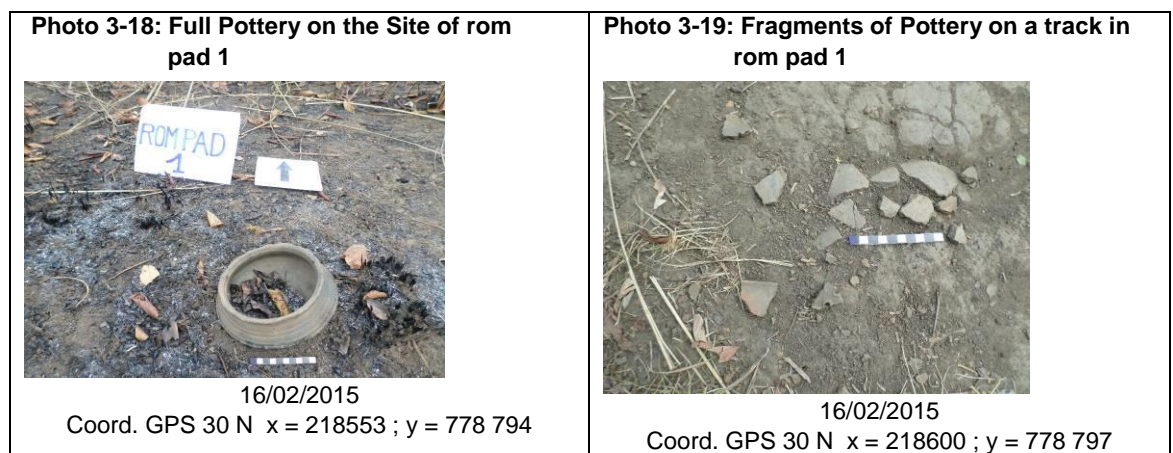
These observations clearly indicate that Waste 2 houses archaeological sites marked by fragments of pottery and slag that lie beneath the soil and that the activities of the stampederes uncovered.

### 3.1.6 Exploration on Rom Pad 1, Accommodation, Waste Infill, Plant 1 and 2

Surveys carried out on these sites provided no significant remains. Only Plan 2 and Rom Pad 1 have revealed a few items of pottery. On the other hand, gold mining activity remains intense on all these sites, causing a great reworking of the ground.

The Rom Pad extends in the North of Angovia village. This Site, which seems to be the continuation of a sacred forest, yielded pottery in its eastern part: A full pottery (See Photo 3-18), and a set of fragments of pottery on a pedestrian track at about 50 m west of this full pottery (see Photo 3-19).

The full pottery presents decorations at the level of the neck. The lip of the pass indicates a state of degradation that bears witness to a long period of neglect.



The site of the Rom pad 1 does not offer a major archaeological potential. The exploration of this site preceded that of sectors for the construction of infrastructure: accommodation, plant 1 and 2 and waste infill.

### 3.1.7 Archaeological Data of Plant 1 and 2, Accommodation, and Waste Infill Sectors

The sectors meant for Waste infill and Plant 1 and 2 are areas marked by an intense activity of gold panning by the gold panners who discover more often remains in the wells that they dig.

The sector destined for the construction of dwellings (accommodation) (see photo 3-20) covers a very armoured area. Surface observations yielded no vestige.

The balance of prospecting on all these sectors is very insignificant, due to the scarcity of remains.

**Photo 3-20: General view on housing Site (accommodation)**



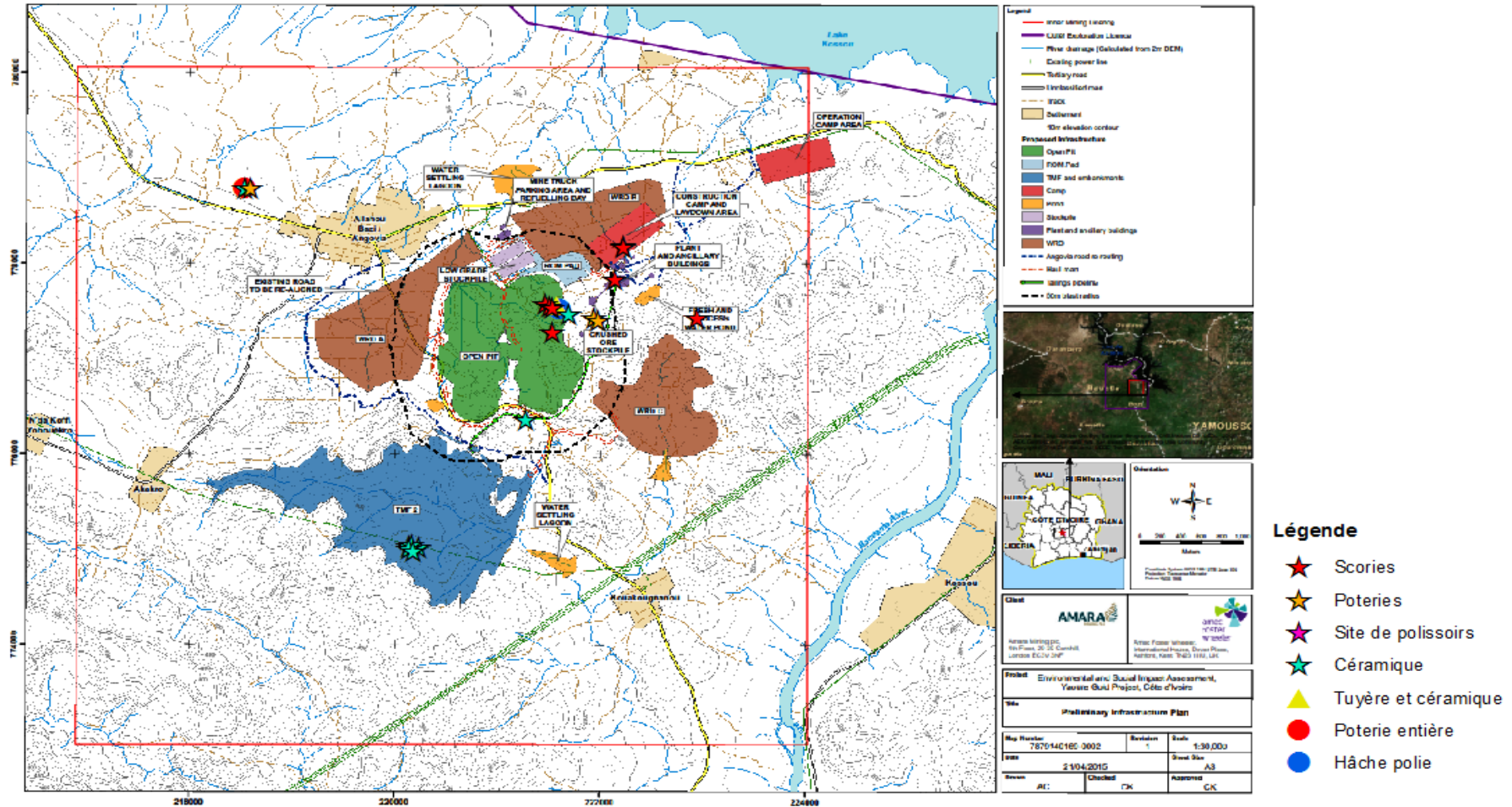
17/02/2015

Coord. GPS 30 N x= 223 650; y= 7792010

Ultimately, the archaeological study on the site of Yaoure gold mining project, enabled to assess the archaeological potential. Several types of remains have been discovered: the polished hatchets, ceramic fragments, remains of ancient metallurgy. Apart from the polisher on the TMF 3 site, all archaeological structures overall highlighted are microstructures which are no longer in their context of initial deposit. Elsewhere in the sector of TMF 2, a still undisturbed ceramic site, can give us some information about the lives of the people who had lived there.

The site, well preserved, is located between a sacred forest and the ancient cemetery of the village Kouakougnanou, including the interest of taking into account the cultural heritage study.

Map 3-1: Location of the Archaeological Sites on the exploration permit



## 3.2 Sacred Sites Study

Two types of sacred sites are documented on the exploration licence of the Yaoure gold mining project: cemeteries and sacred forests.

### 3.2.1 Cemeteries

Within five (5) villages surveyed, the cemetery seems closely linked to the social and religious life of the populations. Destined to the burial of the dead, the cemetery is a place of memory where the populations maintain permanent contacts with the spirit of the dead (and particularly those of the ancestors through different types of rituals). The cemetery usually occupies the site of the old village deserted or abandoned.

One must distinguish the cemetery in use from the former cemetery. The former cemetery is the one that is abandoned, where there is no more burial. It still has its attributes of sacred place and always attracts the attention of the elders who ensure its preservation by virtue of its status: place of worship to the dead.

**Photo 3-21: Survey in Kouakougnanou**



10/ 02/2015

### 3.2.2 Sacred Forests

Sacred forests are places of worship for deities which are represented by:

- A Boulder;
- A hill;
- A portion of land delimited;
- A river;
- A tree;
- Water.

The spirit of the divinities embodied in the above mentioned elements serve several functions which helped classify them into four (4) major groups:

- The function of protection against malicious spirits;
- The function of prosperity (promotes enrichment);
- The function of fertility (offer children for couple under sterility);
- The invisibility function (offer the power to disappear before enemies).

### 3.3 Problem of Sacred Sites Relocation

The question of the sacred sites relocation is a concern in the context of mineral exploration. Indeed, the current exploration could identify important areas of mineralization, however containing some of these sites. The fundamental question raised on this issue is in which measures their relocation can take place.

According to data obtained in the survey at Kouakougnanou (See Photo 3-21), it is possible to move an old cemetery, while one in use is hardly movable.

According to the socio-economic needs and concerns, (developments of the village, public or private utility works) the cemetery may be relocated to a new site. In this case, requirements relating to sacrifices are necessary to the operation of relocation.

Unlike the cemetery for which the issue of relocation rely on the decision of the customary authorities, the sacred forests-related issues are the responsibility of the heads of families who are the holders. Here, the displacement of the sacred forest is negotiated with the leaders of these sacred sites who give the conditions.

The displacement of sacred sites is ultimately a negotiating approach that takes into account customary requirements defined by the concerned village authorities.

### 3.4 Investigations for the Validation of the Sacred Sites Map

Investigations were conducted to confirm the sacred sites mentioned on the map developed by Amara Mining Cote d'Ivoire SARL, in five (5) villages directly affected by Yaours gold project:

- Kouakougnanou (See photo 3-21);
- Angovia (See photo 3-22);
- Allahou Bazi (See photo 3-23);
- Akakro (See photo 3-24);
- N'da-Koffi Yobouekro (See photo 3-25).

We interviewed the landlords, the guardians of the sacred sites and the Chief of village of the different localities mentioned above on the effectiveness of the inventory of all their sacred sites.

These various officials have unanimously indicated that all their sacred sites (cemeteries and sacred forests) had been inventoried and the mapping of these sacred sites was conducted in collaboration with representatives from each village.

The Community Advisory Committee (CAC) assigned to monitor the mining company activities and report to the populations, also verified the validity of the sacred sites map (see Map 3-2).

All the representatives of the surveyed villages confirmed that they were satisfied with the work done and that all their sites (cemeteries and sacred forests) have been mentioned on the map. This investigation helped validate the (sacred sites) map produced by Amara Mining Cote d'Ivoire SARL. Therefore, it becomes the reference map that the company will consider in its new planning.

**Photo 3-22: Survey in Angovia**



11/ 02/2015

**Photo 3-23: Survey in Allahou Bazi**



12/ 02/2015

**Photo 3-24: Survey in Akakro**



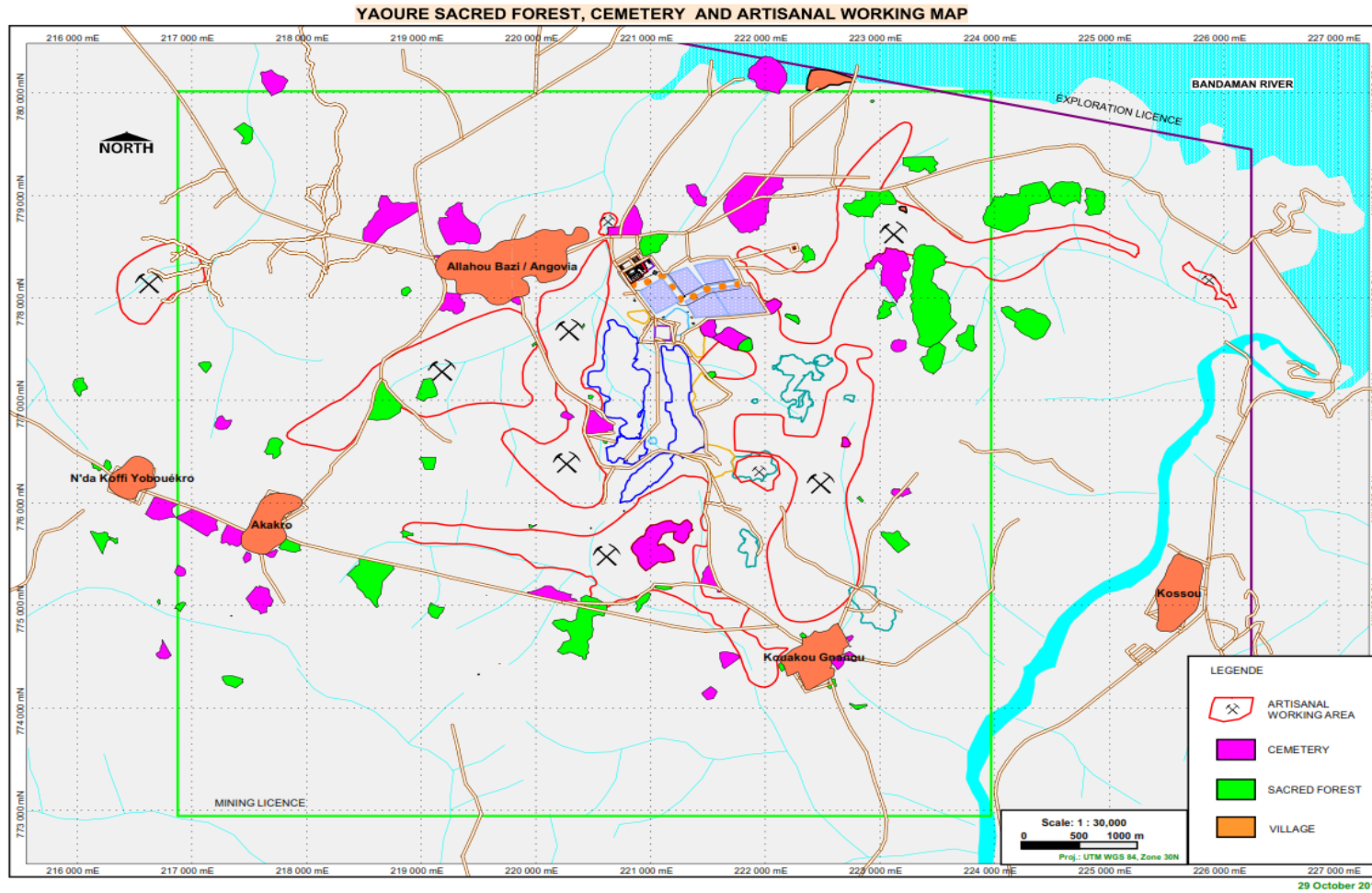
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**Photo 3-25: Survey in N'dakoffiyobouekro**



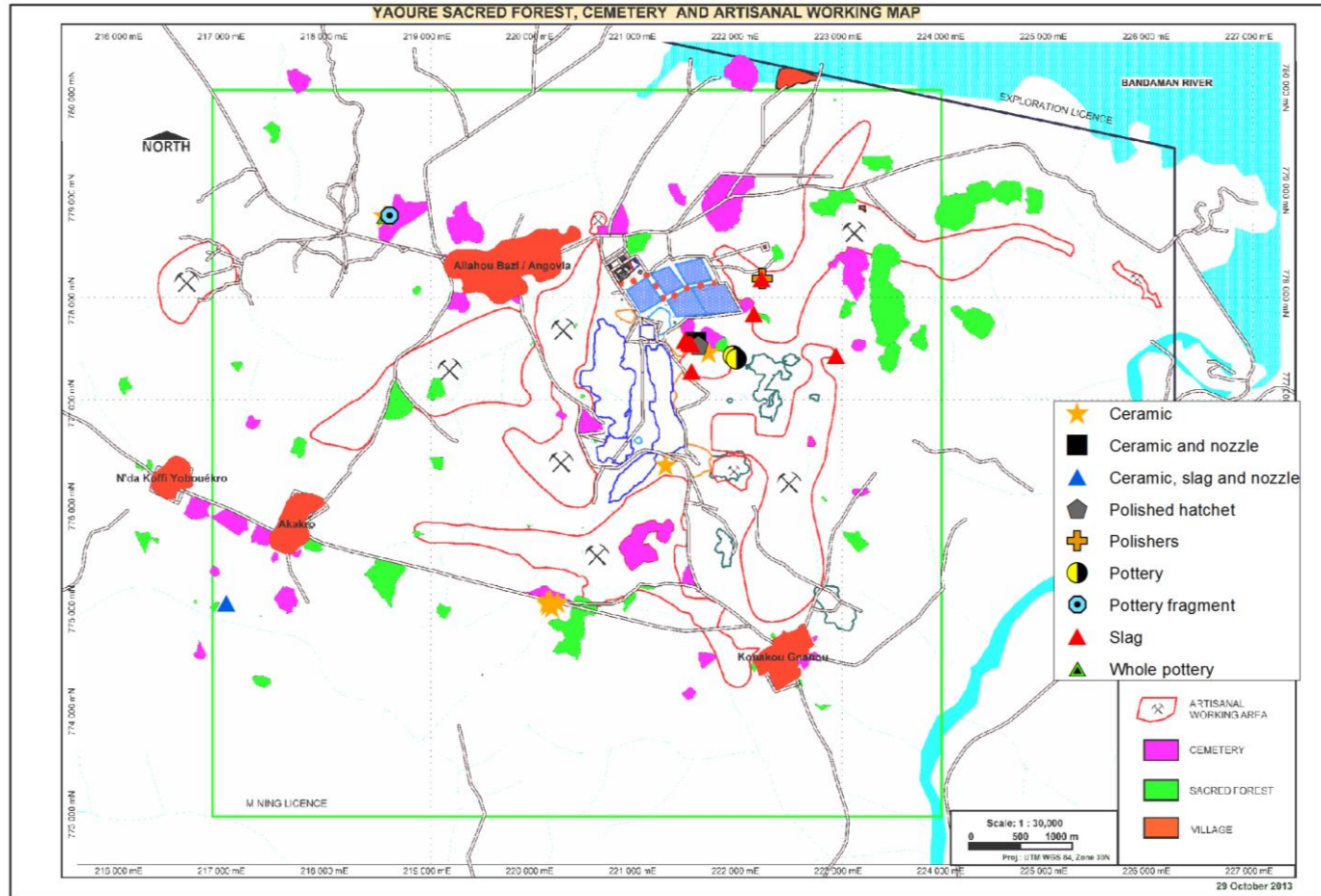
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Map 3-2: Location of the Sacred Sites on the exploration permit of Yaoure gold project





Map 3-3: Synthesis of Sacred Sites and Archaeological Data on the Site



### **3.5 Partial conclusion**

The archaeological survey carried out on the exploration permit of Yaoure gold project revealed a few archaeological remains. The ceramic is very abundant. The remains of the ancient iron metallurgy which most visible witnesses, mainly consisting in slag, are sometimes associated with ceramics. Traces of the Neolithic period are marked by the site of polishers on TMF3 and polished hatchet.

All these data indicate that the exploration permit of the Yaoure gold project was occupied at different periods of the history of humanity. The diversity of the remains is the testimony of the vitality of societies which succeeded to others in this area.

Unlike the archaeological sites that suffered significant damage, sacred sites are still well preserved. Places of worship, sacred family-owned forests are not absolutely fixed entities; they can be moved to meet concerns of high interest which requires it.

## 4.0 IMPACTS ASSESSMENT

### 4.1 Impacts Description

The exploration permit of the Yaoure gold project is located in an area of intense activity of gold panning. The gold panners' wells already disrupted most sites and archaeological remains so that the activities of the company will have a low impact on the archaeological data.

### 4.2 Impacts Assessment

#### 4.2.1 Impacts Sources

The quarry operations, the establishment of infrastructures, including the construction of factories, homes and opening of roads can cause the destruction of some remains.

The different types of rejects from the quarries and the treatment plant will engulf archaeological objects; whether on the surface or below ground.

Impacts Potential Consequences

Archaeological structures in depth can be demolished by mining activities which require excavations.

These same works may involve the extraction of archaeological objects from their initial context.

#### 4.2.2 Importance of Impact in Wider Environment and Taking into Account of the Vulnerability of Specific Receptors

The table below shows the assessment of the identified impacts.

**Table 4-1: Assessment of the Identified Impacts**

Impact	The disruption of the archaeological context of the remains is possible		
Nature	The impact is negative		
	The excavations and the soil stripping cause a revamping of the archaeological layers		
Impact nature	Direct		Cumulative
	On the sites provided for mining, the redevelopment of the ground could disrupt the initial order of the remains, alter the sites, and contribute to the loss of time series data, making impossible any form of dating.		
Probability		3 = Probable	
Duration			4 = Permanent
	Potential impacts are irreversible		
Etendue	2 = Site		
	More broad region for installing infrastructures will also needed.		
Magnitude / scale	1 = Low		
	Low because the sites as a whole are already reworked by the gold panners.		
Impact importance	21 – 56 = Low		
	The weakness of the impacts is justified by the fact that: - most of the mine sites are already altered due to gold panning; -TMF 1 and 4 are generally localized in valley area that delivers no archaeological data.		

## **5.0 MANAGEMENT AND MONITORING REQUIREMENTS**

The taking into account of some management and monitoring provisions is necessary for the mitigation of the identified impacts.

### **5.1 Management and mitigation requirements**

- The establishment of a unit responsible for cultural heritage, whose members are divided on the working sites of the mine, is necessary. This cell will be responsible for collecting any remains unearthed during construction and quarry excavation work;
- A training for recognition of archaeological remains to technical staff working on the sites of construction and excavation, shall help in the identification of archaeological objects;
- Provide the resources needed to carry out preventive excavations of the ceramic site identified on TMF 2. After the excavation, TMF 2 may be used.

### **5.2 Residual Impacts**

The re-evaluation of impacts will consist in searching in the excavated material from the sites of rejection, to identify possible remains contained therein.

### **5.3 Monitoring Requirements**

Provisions for monitoring is needed during the operation that requires ground excavations.

Establishment of a training program, a month before the start of activities related to the operation of the mine (construction of infrastructure, opening of the access roads to the various sites, and excavations of mines)

Programmed visits of a team of archaeologists on the sites to collect archaeological data is necessary during the monitoring.

## 6.0 SUMMARY AND CONCLUSION

The archaeological and cultural heritage study on the exploration area for Amara Mining Côte d'Ivoire SARL has highlighted a diversity of cultural heritage sites.

Archaeologically, thirteen (13) sectors surveyed, six (6) (TMF2, TMF3, Rom Pad 1, Waste 2, the infill Pit, and the PIT Northeast sector) have delivered traces for which most of them do not seem in place. Discovery sites are, most often, in a state of very pronounced degradation caused by gold panning activities; What does no longer help make a fair reading of the observed remains, these being no longer in their original archaeological context.

However, is it necessary to indicate that the ceramics site located on TMF2 is interesting. Indeed, it is not yet disturbed. It is therefore recommended to carry out an archaeological dig before the realization of any activity related to mining. (See annex: proposal of the archaeological dig on TMF2 programme). This is a unique opportunity that presents an analysable data collect that can contribute to the knowledge of the history of the operating societies.

Also, is it necessary to avoid destroying the polishers rock located on TMF 3. A space of at least five (5) metres radius must be delimited to ensure its integrity.

Beyond these two types of sites, Amara Mining Cote d'Ivoire SARL mining area lacks major archaeological sites. Nevertheless sacred sites, including sacred forests and graveyards, abound. They were inventoried and mapped to allow the company to take into account their presence, in the mining activities planning. However, in case of necessity, the relocation of a sacred site may be considered consistent with the customary responsible in charge of their management.

## 7.0 BIBLIOGRAPHY

-**AVENARD (J.M) and AL**, the natural environment of Côte d'Ivoire, éd ORSTOM, Paris, 1974, p 391.

-**KOFFI (K.S.)**, the carved stones of Gohitafla (centre-west of Côte d'Ivoire, Marahoué region) chronological context and interpretation, single doctoral thesis, University of Cocody, Abidjan, 2011, p 344.

-**KOUAO-BIOT B.**, 2004, "Strategies for the safeguarding of sites in danger: the cases of Fanfala and Gohitafla (Cote-d'Ivoire)": 383-390, in BAZZANA A. and al. (eds.), 2004, from North to South of the Sahara: 50 years of French Archaeology in West Africa and in Maghreb: assessment and prospects. [Actes du colloque, Paris, 13-14 mai 2002], Edition Sépia, Paris, p 446.

-**ZAMBLE BI (Y. J.)**, «Bouaflé from origins to 1936», in Revue Ivoirienne d'Histoire, No. 2, Abidjan, EDUCI, 2003, pp. 40-58.

### LAWS AND CONVENTION

Act No. 87 - 806 of July 28, 1987 on the protection of cultural heritage in Côte d'Ivoire.

Act No. 96-766 of October 3, 1996 on The Environment Code.

Convention for the safeguarding of the intangible cultural heritage, adopted in Paris on October 17, 2003.

## 8.0 ANNEXES

### Annex A : QUESTIONNAIRE

### QUESTIONNAIRE

- 1 Have you been informed about the identification project of your sacred sites by Amara Mining?
- 2 Did you receive the team responsible for the identification of these sites?
- 3 Did you accompany them on the various sacred sites?
- 4 Did they present you the map of the sacred sites that they developed according to your data?
- 5 Were you satisfied with the taking into account of all the sites you listed to them?

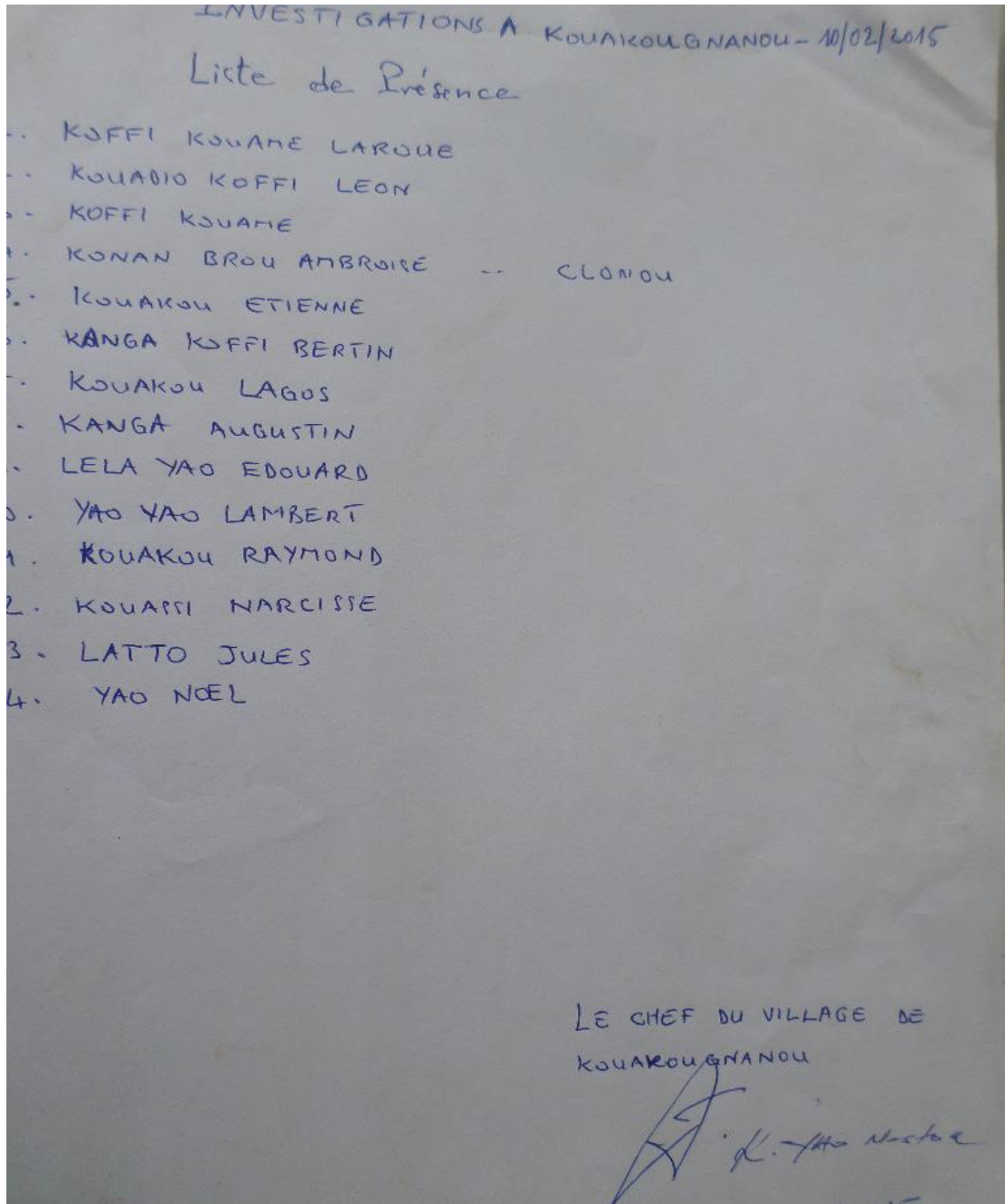
		<b>RESULTS</b>									
<b>VILLAGES</b>	<b>ANGOVIA</b> 11/02/2015		<b>ALLAHOU B</b> 12/02/2015		<b>KOUAKOU GNANOU</b> 10/02/2015		<b>AKAKRO</b> 17/02/2015		<b>N'DA KOFFI YOBOUEKRO</b> 17/02/2015		
	<b>QUESTIONS</b>	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Question 1	X		X		X		X		X		
Question 2	X		X		X		X		X		
Question 3	X		X		X		X		X		
Question 4	X		X		X		X		X		
Question 5	X		X		X		X		X		



## Annex B : List of People Surveyed

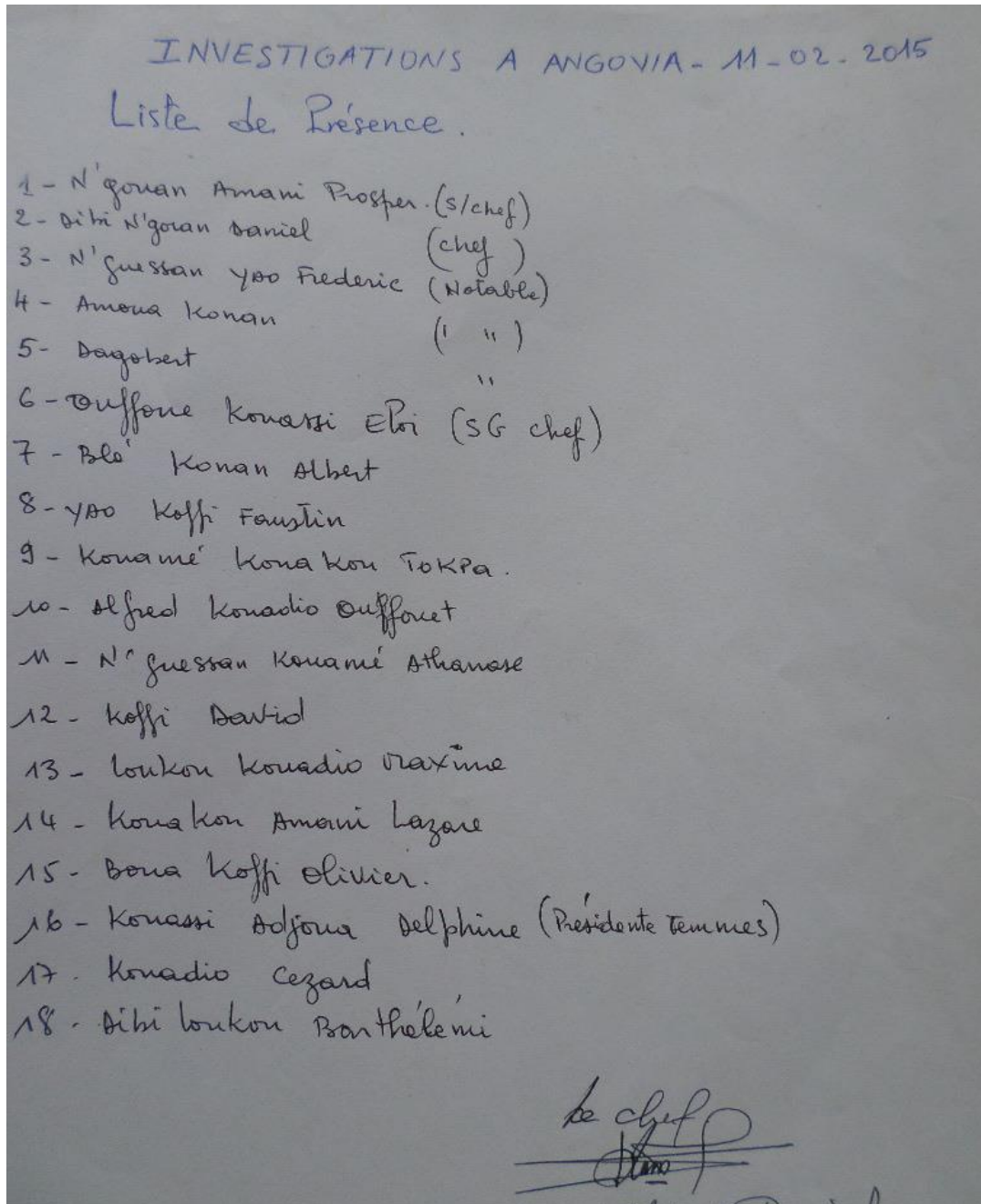
**LIST OF THE PEOPLE SURVEYED IN KOUAKOUGNANOU**

FEBRUARY 10, 2015



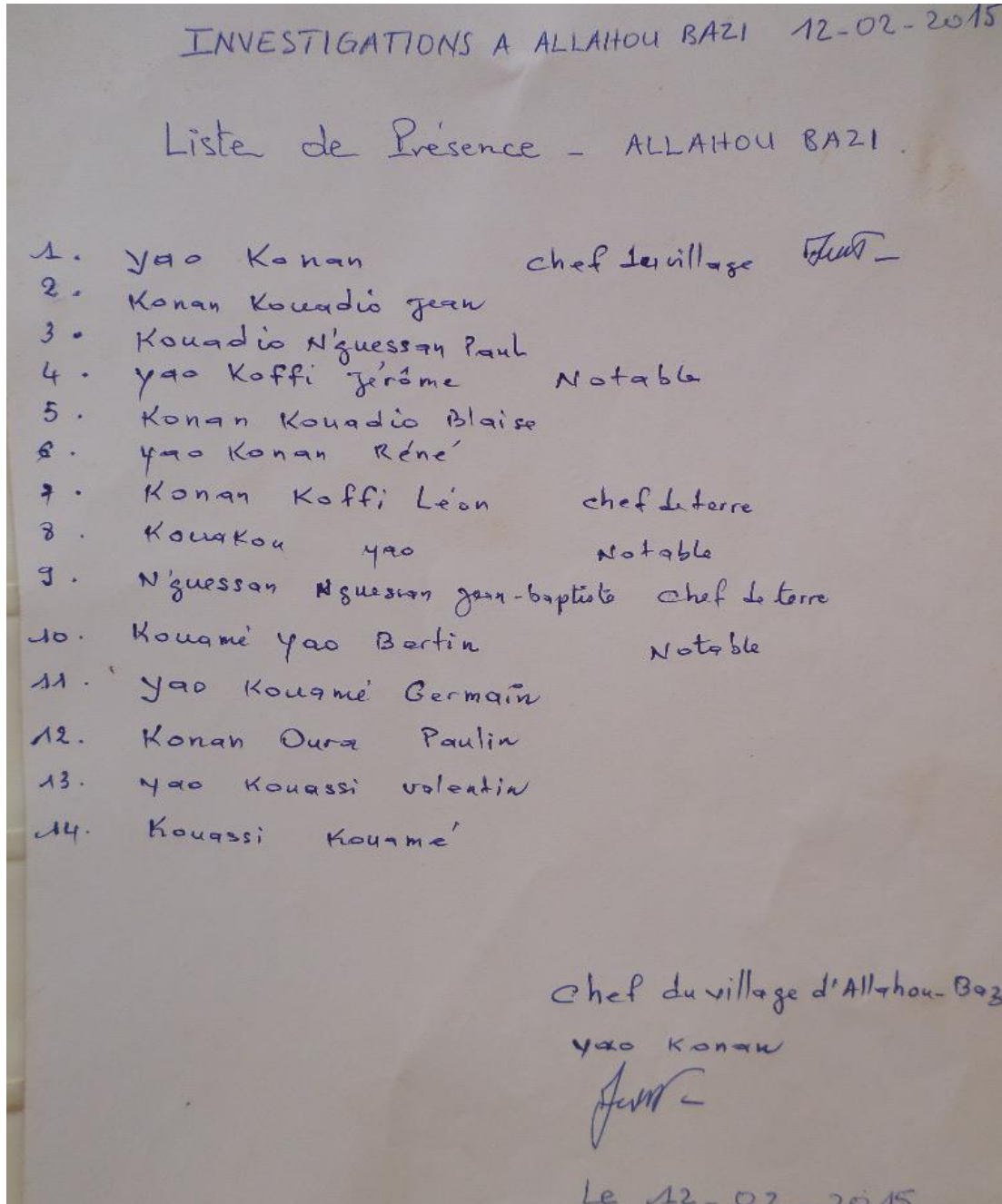
**LIST OF THE PEOPLE SURVEYED IN ANGOVIA**

FEBRUARY 11, 2015



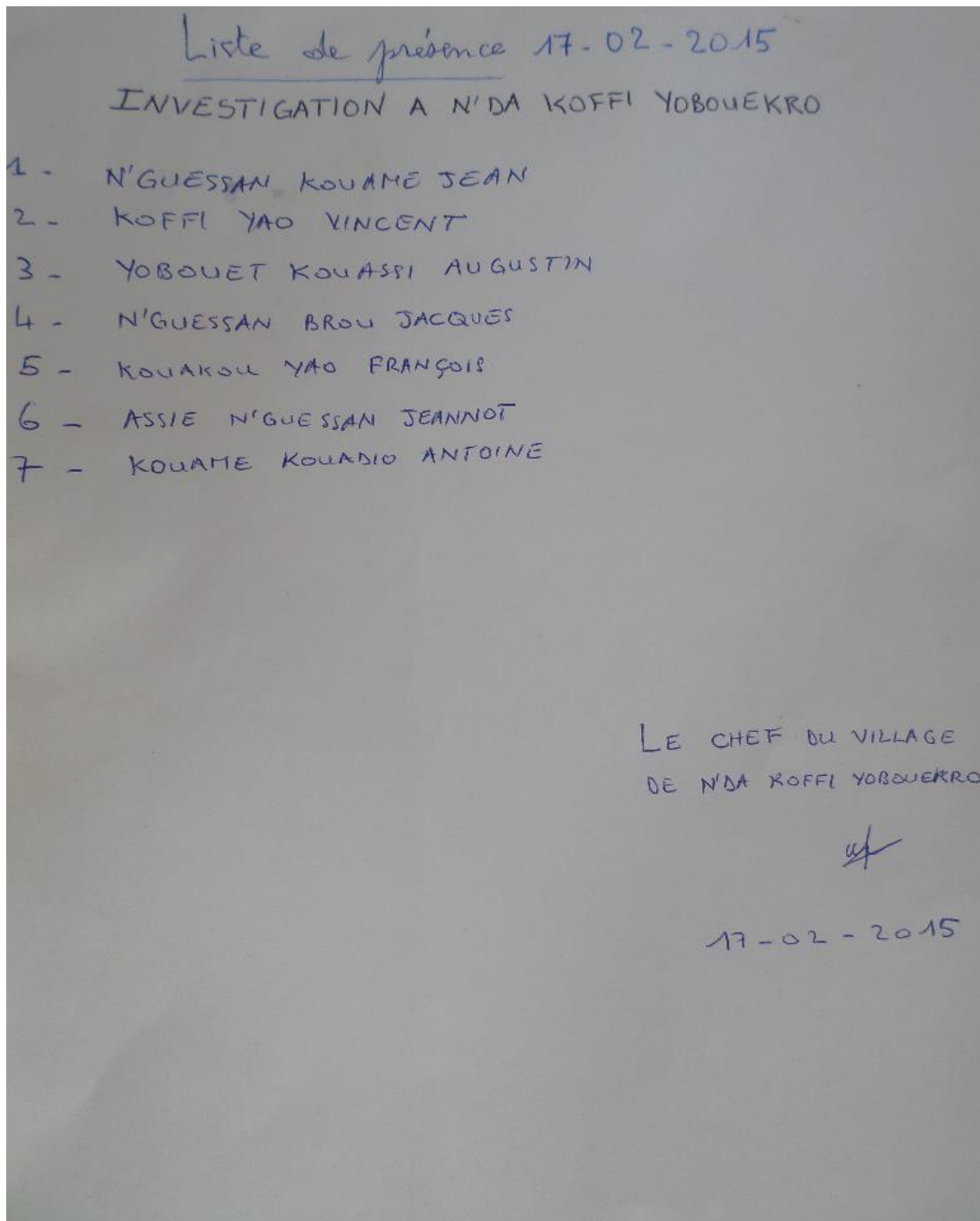
**LIST OF THE PEOPLE SURVEYED IN ALLAHOU-BAZI**

FEBRUARY 12, 2015



**LIST OF THE PEOPLE SURVEYED IN N'DA –KOFFI YOBOUETKRO**

FEBRUARY 17, 2015



**LIST OF THE PEOPLE SURVEYED IN AKAKRO**

FEBRUARY 17, 2015

