

Initial Environment Examination - revised

Project: ADB Grant No 0117 LAO SF

Lao PDR: GMS Sustainable Tourism Development Project

SUB-PROJECT 2:

VANG VIENG DRAINAGE AND TREATMENT IMPROVEMENTS

ANNEXES ARE AVAILABLE UPON REQUEST
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LIST OF ABBREVIATIONS

| | |
|---------|---|
| ADB | Asian Development Bank |
| Ban | Village |
| EA | Executing Agency |
| EARF | Environmental Assessment Review Framework |
| EMP | Environmental Management Plan |
| Gvt | Government |
| IEE | Initial Environmental Examination |
| Kip | Currency of Laos PDR (1 USD = 8.470 Kip as per March 21 st 2010) |
| Lao PDR | People's Democratic Republic of Laos |
| LCG | LaoConsulting Group, Vientiane |
| LNTA | Lao National Tourism Agency |
| MRC | Mekong River Commission |
| NGO | Non-governmental organization |
| PCU | Project Coordination Unit |
| PIU | Project Implementing Unit (Provincial Level) |
| RoW | Right of Way |
| STDP | Sustainable Tourism Development Project |
| STEA | Science, Technology and Environmental Agency <i>[this responsibility has now been taken over by WREA]</i> |
| UXO | Unexploded ordnances |
| WREA | Water Resources and Environment Administration |

VANG VIENG DRAINAGE AND TREATMENT IMPROVEMENTS

A. Introduction

1. The site is located in Vientiane Province, in the town of Vang Vieng, the capital of Vang Vieng District. The town is located on the main tourist route (Highway 13) about half way between Vientiane and the World Heritage town of Luang Prabang. The town is located adjacent to the Nam Xong that flows into the Mekong River. The town is also accessible by boat from Vientiane.

2. In September 2009 Vang Vieng Town and Environs has been subject to a town Masterplan¹ covering the period of 2010-2020. The plan's main objectives are (i) to promote Vang Vieng as green, safe and friendly town, (ii) to manage development in a sustainable manner, (iii) consolidate the urban core and re-define urban growth boundaries, (iv) facilitate orderly town development. As for environmental concerns, the plan advocates to (i) protect the natural landscape of both the town, its karstland environs and the Xong River, (ii) protect panoramic corridor views, (iii) improve air and water quality and reduce noise pollution levels, (iv) identify, conserve and protect sites of cultural heritage and (v) identify, conserve and protect local biodiversity values. The plan also addresses several objectives to support the local tourism sector. To achieve the proposed goals, the Masterplan foresees 35 actions to be carried out over the next 10 years. Suggested planning tools include the establishment of particular town zones, permissive building design regulations, landscaping, street and pedestrian furniture and the establishment of a Central Park.

3. Improvements to the town's road and drainage system have been undertaken in recent years under the Small Towns Development Sector Project (ADB TA 3492-LAO). The proposed works under this Sub-Project are essentially an extension of the implementation of the Small Towns Development Sector Project with the addition of installing gross pollutant traps on main drainage lines to reduce the level of waste entering the river system. To meet this target, the project also foresees the establishment of a large drain/stormwater collection pond in the Southern periphery of Vang Vieng town. Another main aspect being tackled by this sub-project relates to improving the town's waste management system.

4. This updated and revised IEE has been prepared on the basis of site visits, review of available information, web research and consultation with key stakeholders. Besides, the field activities included the retrieval of updated town planning regulations, and the creation of a 5-year river water quality monitoring program together with the provincial agency responsible for environmental management (WREA).

5. Disclaimer: This document represents a revision and updating of information, based on the original information provided in the 'ADB Initial Environmental Examination Report, Output 3 – Facilitation of Tourism on the North South Economic Corridor Project No. 38015', dated March 2008. All views expressed herein originate from the Environmental Expert Team contracted for actualizing this document, and do not necessarily represent those of the ADB Board of Directors, Management or Staff, and therefore may be preliminary in nature.

6. Acknowledgement: The Environmental Team wishes to express their appreciation to all persons who shared their views, gave guidance and recommendations. Special thanks go to the Dept. Director of the Lao National Tourism Agency, Mr. Thavipeth Oula and his advisory team,

¹ HANSEN & Partnership, Urban Planners and Landscape Architects, Australia, 2009

namely Mr. Steven Schipani, and to the Heads of the Vang Vieng Town Planning Authority, Mrs. Sor Bounmany, and Chief Engineer Mr. Phuttasone Khamlua. Acknowledgement is also attributed to Mr. Singvi Xay (Head of VV Water Supply Agency) and to Mr. Mixay Thantavong, Head of the Provincial WREA Office, and his staff for jointly establishing a Nam Xong water quality monitoring program. The team would also acknowledge the generous help offered by assistants affiliated to the above agencies, who accompanied during various parts of the field surveys and assisted in meeting with stakeholders. Particular acknowledgement goes to the administration staff of LaoConsulting LTD who facilitated all field works and mobilization.

B. Description of Project

B.1 Physical Works (Civil Engineering) and Schedules

7. The project entails the following technical and infrastructure rehabilitation/new construction elements and activities focusing on both urban waste water management and sanitation, as well as some activities in line with the general improvement of the environmental situation of urban Vang Vieng:

- Urban Waste Water centralization and Treatment:
 - Construction of 3 Gross Pollution Traps at drainage channels 1,2² and 6
 - Excavation. Shaping and compaction of a large collection pool situated in a wetland in the southern part of urban Vang Vieng, near Meung Song Primary School complex (see Annex 6).
- Rehabilitation of existing drainage structures:
 - construct 575m of stormwater pipes down cross road 1 to drain 4, 275m to drain 5 and extend road drainage by 1150m along road 1;
 - construct a wetland filter for drainage lines 3 and 4 on public land where they merge.
 - Rehabilitation of drainage channel and culverts along cross roads 1,2, 3 and 6
- Improvement of Urban cross roads
 - selected cross roads will receive sealed pavement, kerbs and stormwater pipes
 - improvement or new construction of pedestrian walkways
 - possible re-greening the crossroad alignments with selected trees
- Improvement/Rehabilitation of the Road Entry to Town Center
 - construct 150m entrance road to town between the airstrip and road 1 with sealed pavement, kerb and piped stormwater;

8. After consultation with the Technical Design Team, the anticipated schedule for the above civil works are as follows: Completion of bidding and award of contracts in July 2010, start of construction works, August/September 2010, provisional completion of civil works January/February 2011. The non-physical activities described in the next section are likely to be carried out and completed during the same period.

² given the difficulty of access, existing private land tenure holdings and higher costs of servicing the traps, other locations might be still explored – subject to the detailed engineering survey due in April 2010

B.2 Non-physical Project Activities

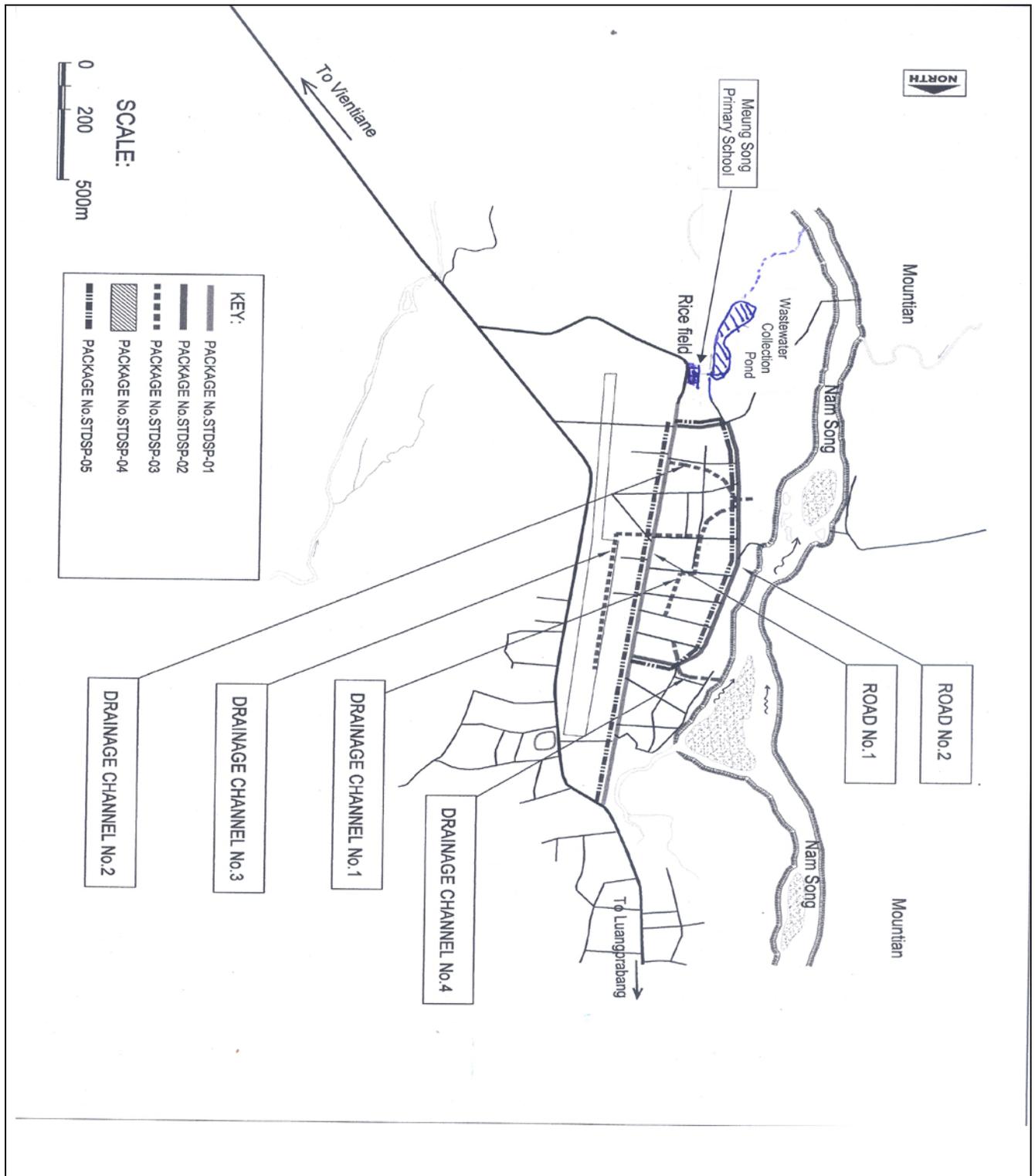
9. The project plans for several supportive activities such as:
- A long-term (5 years) Water quality Monitoring Program for Nam Xong River, to ensure the sustainability and functionality of the planned drainage and treatment measures
 - Supportive equipment to the urban waste management system
 - Provision of a second waste collection dump truck
 - Provision of additional water/sludge tank and pumping equipment to manage the urban septic tank management program
 - Public awareness campaigns, targeting the public general with respect to hygiene and sanitation, waste collection and disposal, separation of waste material for further re-use and recycling, general and specific environmental protection of the Vang Vieng environs and natural resources.
 - Training of the staff of the urban town planning agency (VVUDAA) in the fields of environmental management, conservation of resources, data collection and surveys, addressing key issues related to the booming tourism development
 - Workshops on the above aspects
 - Development of supporting mechanisms to generate revenue from public assets, e-g- from road & bridge tolls, visits to attractive sites etc.
 - Evaluation of mechanisms to retrieve sufficient revenues from the usage of the communal drainage and solid waste collection system
 - Set-up urban/district regulations³ on sanitation, garbage collection fees, contribution to drainage system

B.3 Location of the Proposed Civil Works

10. Map 1 indicates the location of the civil works planned under this project. As for the water quality monitoring program of Nam Xong and its sampling stations, reference is made to Annex 2 of this document.

³ The VVUDAA has partly accomplished these tasks; for details, see Annexes 5 and 6

Map 1: Location of proposed civil works for drainage and waste water treatment structures



[Source: Technical Design Team, LaoConsulting 2010]

B.4 Expected Outcomes and Benefits from this Project

11. The project outcomes are aiming to:
 - (i) Contribute to the reduction in downstream river pollution, and establish a five-year river quality monitoring program .
 - (ii) Protect the river water quality for local and tourism use by upgrading the urban drainage and waste management system.
 - (iii) Enhance the environmental quality of Vang Vieng town as an attractive tourist center and place to live for its residents.

12. To achieve the above outcomes and expected benefits from this Sub-Project, the overall scope of works will be to:
 - (i) build extension of drains in the core of the town, mainly along the cross roads
 - (ii) introduce at selected sites road pavement and pedestrian walk improvements to secondary roads in the town core
 - (iii) construct stormwater treatment facilities, with primary screening to remove solid waste through use of gross pollutant traps and a wetland collection pond as natural (pre-treatment) filter basin
 - (iv) provide for an additional vehicle for solid waste collection to the Town Planning Agency, and address current issues associated with the operation of the landfill site;
 - (v) conduct awareness campaigns to residents and business establishments on maintenance of septic tanks and compliance with the new urban sanitation regulations; and
 - (vi) training of the Urban Development Administrative Authority staff to ensure that guest houses, restaurants and commercial establishments comply with the new regulations on sanitation and waste management.

B.5 Cost Estimates

13. The costs for the civil works, as reflected in the current planning documents for this Grant component amount to US\$ 1.089 million, whereby US\$ 915,000 originates from ADB financial support sources. The supportive program for additional equipment, septic tank program, awareness campaigns, contribution to VV Masterplan, exploration of revenue-generating mechanisms and set-up of communal fees for sanitation and garbage, amounts to US\$ 328,000, financed exclusively by ADB sources.

14. The budget set aside for environmental management activities totals US\$ 20,280. This budget is specifically allocated (a) US\$ 16,780 to a five-year water quality monitoring program for the Nam Xong River⁴, and (b) US\$ 3,500 to an annual environmental clean-up operation on the newly established drainage lines and the gross pollutant traps, from 2011 until 2015.

⁴ to be carried out and administered by the local WREA staff from March 2010 until Feb.2014; details are given in **Annex 2**

C. Description of Environment

C.1 Physical Environment

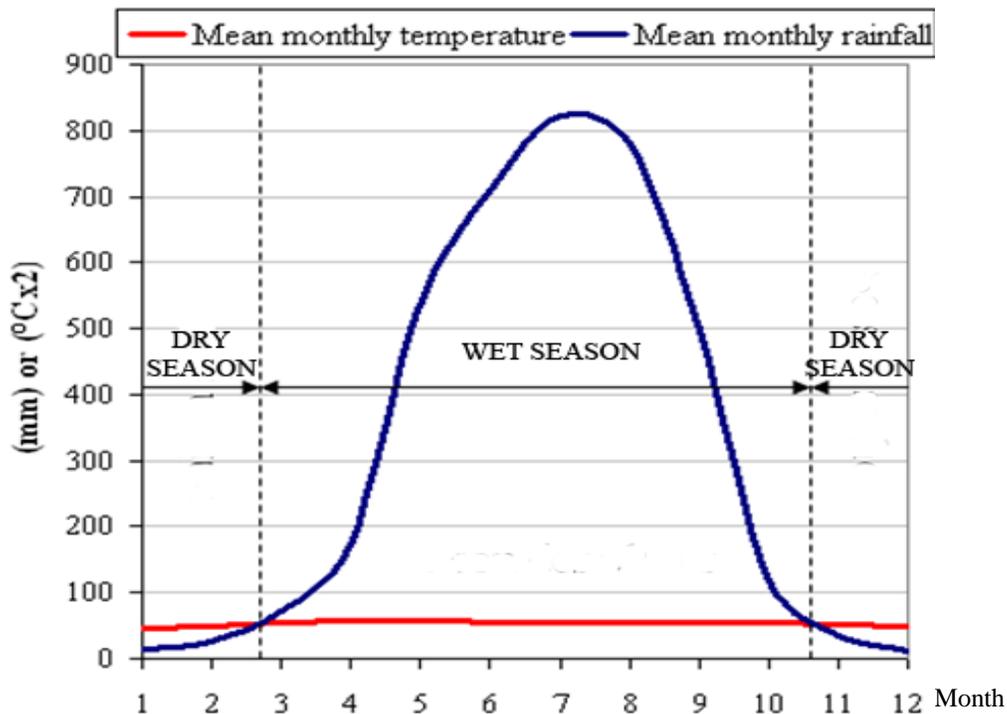
15. The town is located in Vang Vieng District in Vientiane Province. The town is situated on the main tourist route (Highway 13) about half way between Vientiane and the World Heritage town of Luang Prabang.

16. The town is located on an alluvial plain of the Xong River at an elevation of about 200m with karst mountains rising to 500-900m. The soils are friable clayey loam extending to a depth of about 1m above alluvial deposits. Baseline hydro-physical and hydro-biological information on the Nam Xong River are included in **Annex 2**.

C.2 Climate

17. The rainfall varies from 1000mm-2800mm between years with about 85% of the rainfall received during the monsoon season between May to September (Table 1 and 2). The temperatures range from a low of 18°C during December to 33°C in February with the hotter months being February – May.

Table 1: Key meteorological parameters of Vang Vieng



C.3 Biological Environment and Sanitation

18. According to discussions with the WREA Provincial Agency there is little information available on biodiversity and the biological values in Vang Vieng region. The natural values of the town have been largely modified during the past 15 years through urban development initiatives – many of them not in an orderly town planning manner. The central area of urban Vang Vieng consists of an old airstrip used for operations during the Vietnam War.

19. Currently there is little substantive remnant vegetation or habitat within the town (public) area with the exception of some mature indigenous hardwood trees and individual trees and bushes planted in private properties. It was agreed that the town planning agency will undertake a tree counting within the entire public area of Vang Vieng to identify the need for further re-greening the town.

20. Although recent urban regulations on Sanitation (**Annex 4**) stipulate that households and small businesses are obliged to treat all liquid wastewaters by septic tanks, grey water from kitchens, laundries, commercial activities such as cleaning and heavily silted storm water runoff is commonly still discharged directly into the drainage system leading to the river. Even while much of the town's black water waste is treated by septic tanks, the continued expansion of the tourism establishments has not been matched in increased septic tank capacity, resulting in widespread discharge of black water into the ground and further exacerbating water pollution in the Nam Xong river system.

C.4 Socio-economic Information

21. There are 22 villages within the Vang Vieng District, 7 of which belong to the proper town area. The district population is 46,399 with 9396 households. The main cultural groups are Lao Lum (75%) with an almost equal share of Hmong and Khmu. The main source of income for the local population is from agriculture and tourism. Cement production is also a major industry located near the town.

22. Only 70% of the rural households in Vang Vieng District have access to safe drinking water. Live expectancy for both men and women in this region reaches 64 years. There is still a high rate of infant mortality (2008) for children up to the age of 5 years, being 98 death for each 1000 children. Intestinal illnesses and infections are the main causes for high infant mortalities. Only 38% of the rural schools make provision for toilets.

23. The socio-economic conditions and livelihood of local residents in rural areas is poor, as the Vang Vieng District is just below the 20% poverty level. Sanitation, public health and security rank among the most prominent issues that hamper the development and progress which is marked in Vang Vieng town – mostly attributable to the booming tourism industry of this destination (since 1996), primarily targeted by backpackers traveling on low budget.

D. Screening of Potential Environmental Impacts and Mitigation Measures

D.1 Analysis of General Environmental Issues in the Vang Vieng Area

24. Discussions and joint analyses with several local authorities allow the conclusion that there are a number of environmental and socio-economic issues that are linked to (i) poor environmental awareness among the public general, (ii) weak administration and enforcement structures, and (iii) insufficient town planning, including a more stringent supervision of the

ongoing activities carried out by the local guesthouse, bars and tour operators; (iv) the local hospital seems to be overcharged with the amount of admissions both from local residents and injured tourists; (v) there seems inadequate police enforcement with crimes, many of them associated with the tourist sector (e.g. drug abuse, alcohol-inflicted issues, ubiquitous noise pollution, violence etc.).

25. As for the specific environmental issues associated to the environs of Vang Vieng, the situation related to Nam Xong river has been particularly assessed. Major issues, causes and proposed remedial actions are discussed in a baseline study attached to this IEE (**Annex 2**). Note that the several of the postulated consequences and enforcement requirements are still to be determined, while several of the analysed issues are assumed to be outside the scope of this project, and therefore need additional planning and funding.

26. Both the Town Planning Agency and the WREA expect that the environmental monitoring and awareness activities planned under this Project will serve as base for further reacting to the environmental degradation, especially of the Nam Xong River System and its immediate habitats.

D.2 Analysis of Potential Environmental Issues Associated with the Planned Project

27. The components (v) and (vi) do not involve any site works and will not cause any adverse impacts on the environment. Components (i), (ii) and (iv) are continuing elements of the Small Town Development Sector Project and whilst having been covered by an IEE for the Small Town Development Sector Project for Vang Vieng, are included as part of the environmental examination for this project. The screening of potential environmental impacts has also been undertaken for component (iii), which is considered to be a new work that is complementary to the Small Town Development Sector Project. The screening indicates whether the impacts are considered to have (i) low impact (L), (ii) moderate impact (M), and (iii) high impact (H).

28. The measures to reduce or mitigate the potential impacts identified with works for component (i), (ii), (iii) and (iv) are listed in Table 2 of Appendix 1. The Table indicates the (i) site works/activity, (ii) potential environmental impacts, (iii) mitigation measures, (iv) responsible entity, (v) monitorable outputs, and (vi) funding.

29. The positive environmental impacts from components (i), (ii), (iii) and (iv) include:

- (i) collection and reduction of stormwater waste that is currently polluting the, Nam Xong and some wetlands in the town's Southern periphery;
- (ii) improve the current collection system of household waste to the sanitary landfill site;
- (iii) support the litter awareness and education programs within the community; and
- (iv) improve the amenity and reduce risks of health problems within the town resulting from inadequate urban infrastructure and increasing visitor levels.

30. The negative environmental impacts attributable to this project are considered to be minor and would mainly apply during the construction stage and temporarily there will be when there is some disruption to road access during the planned maintenance and cleaning works for the newly constructed structures. This will result in closure of the access road to vehicles, expected to last maximum 2 hours when the debris is collected and transported from the trap. The construction of the gross pollutant traps will be on public land and therefore no impacts on private property is anticipated. Equally, the construction of drainage lines 3 and 4 and will not

involve closure of roads during construction or servicing of the trap as it can be accessed via a side-road. None of these works will have an adverse visual impact due to the selected locations and that the facilities will either be underground or at ground surface. The (temporary) development of odour during the works will be minimal and be managed with good workmanship practices.

D.3 Proposes Mitigation Measures and Environmental Management Plan EMP

D.3.1 General

31. The measures to reduce or mitigate the potential impacts identified with works for components described in B.1, including the provisions made for monitoring tasks⁵ are listed in the Environmental Management Plan. The EMP, documented in **Annex 3**, indicates the (i) site works/activity, (ii) potential environmental impacts, (iii) mitigation measures, (iv) responsible entity, (v) outputs and observation results to be verified and monitored, and (vi) funding. In most cases the mitigation measures are capable of reducing or minimising the impacts over time, as none of the identified impacts is severe or long-lasting by its nature.

32. According to the Technical Designers, the provisioned construction works are all of a medium to minor magnitude that would not require the establishment of temporary construction camps within the urban area of Vang Vieng. Hence, a number of environmental concerns normally attributable to infrastructure construction works do not apply for this project.

D.3.2 Public Health, Sanitation, and Accident Risk Management

33. Based on interviews with numerous stakeholders during 2 field visits (October 2009 and March 2010) there are needs to consider certain aspects in relation to the general public health and sanitation: Public health and safeguard providence planning will become increasingly important with the growing numbers of visitors. Some of the scenarios discussed below are already frequently happening and therefore would need due consideration in the near future, particularly in view of proper planning for emergency actions:

a) Boat and tubing accidents, water accident rescue operations:

34. Visitors are generally left at their own fate and risk when they encounter an accident, by engaging in recreational activities either on land or on the Nam Xong River. Rescue means are usually not at hand, and medical care is mostly incapable to cope with the tasks ahead.

35. Proposed mitigation measures include:

- All recreational boats operating on Nam Xong shall be sufficiently be equipped with well-maintained life-jackets. The personnel of the ticket-selling and the respective tour operator shall be responsible for regular checks upon the adequate number, safety status and replacement of life-vests on board. Each tour operator shall also have at least 3 jackets that will fit small body sizes.
- All passengers need to wear obligatorily life jackets throughout the entire boat trips;
- If the water quality of Nam Xong gives reason for public health concern, all water sport activities shall be suspended. The criteria for the river water being unsafe for the public

⁵ In a separate documentation, the Environmental Team prepared *Monitoring Compliance Sheets* to be used as framework for both the Supervision Engineers and the Contractors

shall be established by WREA, following the results of the proposed water quality monitoring program (see **Annex 2**). Tour operators who disregard such warning shall resume full liability in case of legal claims by victims suffering from river pollution impacts.

- All boat drivers transporting tourists shall undergo a good training in rescuing drowned persons, and become familiar with reanimation procedures in case of such emergencies. Repeated and refreshment training shall be scheduled by the PIU or WREA who will employ a qualified person to conduct such training. The training shall be obligatory to all persons involved in the boat operating business on Nam Xong.
- The safety and first aid training shall also be obligatory to the owners/personnel of all kayaking and tubing businesses. Such personnel need receive a specific awareness program alerting to the dangers of such activities under the strong influence of alcohol and drugs, and to warn tube users about the lethal danger of approaching rapids and, in the worst case, the waterfalls adjacent to Don Khone (Li Phi and Khone Phapeng).
- The general public and all visitors shall be informed (included in handout-brochures and adequate signboards at the respective locations) about the general unsafe conditions and fatal risks when using the local sling rope facilities installed at such sites.

b) General Accident Risk Management – Road Accidents

36. In view of the relative remoteness of some tourist attractions in this region and the prospects of increasing numbers of visitors in the coming years, accident management will become increasingly important. At present, the situation for the local Hospital at Vang Vieng is, according to the Chief Doctor, already precarious, as they hardly can cope with the number of admittances. Serious injuries can often be treated in Vientiane or abroad only, at some 160 km distance.

37. Land accidents most likely to happen nowadays include road accidents, involving foot walkers, bicyclers and, above all, motorcyclists, as most rural roads are dirt roads, often with scattered stones and gravel. During and after the rainy season these rural roads become even more difficult.

38. Proposed mitigation measures to improve the overall traffic safety situation on the local rural roads include:

- As for driving licenses, especially for motorbikes; no under-aged children should be allowed to drive such vehicles. Efforts shall be established to get such requirements controlled and enforced.
- Recreational motorcycles may substantially contribute to serious injuries and accidents under the local conditions, particularly when foreign visitors use rental bikes without special knowledge of both the vehicles and the partly rough terrain. The PIU, together with the local community representatives, may therefore consider the introduction of basic safety requirements for the rental of motorcycles to tourists, such as presentation of a valid (international) driving licence
- It is recommended that prominent spots along the highly frequented tracks will be equipped with a short-range radio-phone station which is clearly marked to be used also by the public in case of an emergency call situation.
- The regional health facilities may consider the purchase of an adequate ambulance vehicle to be able carrying injured persons safely to the Vang Vieng Hospital. The driver of such vehicle shall receive a special training in first aid for road accident victims.

c) Improving Safety at Sensitive Spots, during Construction Works

39. Interviews with the local schoolmaster at the site where the drainwater collection pond will be constructed indicate the need for adequately addressing the safety and accident risk associated with the planned civil works. In particular, the schoolmaster of B. Meung Song Primary School (**Annex 4**) came forward with two recommendations to reduce considerably the accident risks that may involve the local school children, as long as following mitigation solutions would be included in the technical design:

- Construct a protective fence (approx. 150 m) at the Western side of the school complex, to prevent school children from accessing the proposed work sites at the wastewater collection pond
 - Provide iron-mesh mosquito screens for all windows of the 8 classrooms that are oriented towards the future wastewater collection pond.
40. Further commended precaution measures include:
- Removal of an existing fence scale to prevent children to climb into the works site
 - Adequate awareness campaign for all schoolchildren, warning signs in the vicinity of school entrance gates, also indicating the imminent dangers associated with ongoing construction works
 - Planting of additional hedges along the fence bordering the wastewater collection pond to reduce construction-related impacts on school children (noise, dust, visual barrier).

d) Waste Management and Sanitation

41. Uncontrolled dispersal of waste material is an environmental problem in the entire area, reportedly being caused by dissatisfaction with the previous waste management operator. It is assumed, that the majority of illicitly spread wastes all over the region (river, embankments, wetlands, forests, or just along roadside terrains) is mainly generated by dissatisfied and irresponsible local residents and less by visiting tourists.

42. At present, Vang Vieng Town Planning Authority has issued a new regulation on the urban waste management, in force since 16 February 2010. Annex 5 discusses the inherent issues with these regulations, and describes the future plans for of VVUDA concerning waste management, enforcements, penalties, awareness campaigns and landfill operations

43. As for this project, the following mitigation are proposed and included in the EMP:
- Certain revenues generated from tourism business shall include an assigned percentage for an environmental protection fund of Vang Vieng. The fund would be used, among others, to support an adequate waste management system by awareness campaigns, hand-out material, illustrative signboards, workshops and street and river embankment cleaning operations.
 - The proposed riverside promenade walkway, as well as other prominent places where tourists gather, shall be provided with a functional waste collection system (containers with lid cover);
 - It is commendable that town planners may consider the establishment of adequate pay toilet facilities at prominent locations.
 - Strict enforcement to contain indiscriminate garbage burning in public areas.

D.3.3 Maintaining Cultural Values and Environmental Integrity

a) Distribution of Good Information Material

44. Visiting foreigners may violate (sometimes inadvertently or due to lack of information) the cultural values and feelings of local populations. Cultural insensitive behaviour that may lead to conflicts with local communities may include loud speaking, scolding, walking in bathing suits in the public, drinking and use of drugs.

45. Proposed mitigation measures:

- The key to any successful achievement of mutual cultural understanding lies in providing good information to all parties involved. As for the visiting tourists, it is important to provide them, right at the first step into the Siphandone when purchasing a boat ticket at Nakasang Tourist Information Centre, a set of adequate information in form of educative signboards, hand-out leaflets, photo tables and well-trained personnel working in the local tourist information shops.
- In addition, small brochures might be planned to distribute among the local guesthouses in the islands. The LNTA already has a good selection of such awareness material that is used successfully throughout the country at popular destinations. The Siphandone Wetlands should certainly share an adequate distribution of such material, including the erection of a number of awareness signboards that would support better understanding of the different cultures.

b) Environmental Enhancement of Vang Vieng Urban Area

46. Vang Vieng has unfortunately decreasing appeal to many recreation seekers due to the continual development of noisy and culturally alienated drinking bars and other amusement facilities. Vang Vieng has also a marked deficit on street trees and landscaping features, although the geographic conditions would be inviting for such features. Finally, the water quality of Nam Xong is increasingly threatened by the indiscriminate influx of pollutants and illicit use of river resources (e.g. gravel mining, non-approved excavation of embankments, construction of retaining walls and other structures).

47. Proposed mitigation measures include:

- Establish a Code of Conduct, addressed to the operation of drinking bars emitting high sound levels, especially during late nighttime. Trespassing such code shall be subject to penalties and/or loss of license for perpetrators.
- The key to avoid unnecessary frictions and misunderstandings between local authorities and visitors from abroad lies in the combination of a consistent and unswerving policy for charging visitors to Vang Vieng on one hand, and provide them with good reasoning and information on how the fees are used for enhancing the environmental value of the area.
- Provide sufficient information (by means of: signboards, hand-out leaflets, tour guide training) to visiting tourists to familiarize them with local customs and restrictions, i.e. information about Lao cultural etiquettes and ethics.
- It needs to be discussed among all stakeholders involved in the widespread habit of collecting levies what would be acceptable for visiting foreigners to avoid the current dissatisfaction and clashes.
- Another solution to create funds for environmental enhancement as well as for community development costs would be to include such fee into the boat, bus and other fares for all foreign visitors, and allocate the revenues at an established share to the

local communities. Such policy could be well explained in respective information leaflets that are suggested to hand out to any visitor contacting a local tourism enterprise. Such information sites should also have basic but accurate geographic maps of the area, including basic information of the most important attractions and environmental conservation issues, and how each individual can contribute in such efforts.

- It is recommended to increase the budget of local authorities to establish a suitable police force to cope with the ongoing and anticipated social problems, including crimes and prostitution.
- Develop an urban re-greening plan to plant roadside trees (selected, endemic species with different botanical properties) along the main longitudinal and cross roads of urban Vang Vieng.
- Explore the feasibility to establish a riverside promenade walkway, as suggested in the Masterplan 2010-2020.
- Consider the establishment of public (pay) toilets at prominent locations in urban Vang Vieng area (see above).

E. Institutional Framework and Environmental Monitoring Plan

48. The Environmental Protection Law 1999 provides overall responsibility for environmental protection to the Water Resources and Environmental Administration (WREA), a new body created within the Prime Minister's Office. All IEE and EIA proposals are considered under the *Regulation on Environment Assessment in the Lao PDR (2002)*. The Regulation on Environmental Assessment under the Law states that any projects affecting the environment requires a project description to enable the Executing Agency (LNTA) and their Provincial Implementation Units (PIUs) to (i) undertake a project environment screening to issue an environmental compliance certificate prior to commencement of any works or (ii) to determine whether an IEE is required and/or to ascertain whether an EIA needs to be prepared.

49. There are no standard guidelines for the environment screening in Lao PDR and judgement is based on experience and considering suggested guidelines in other countries and agencies (e.g. World Bank, ADB). Component (ii) would not require the preparation of an IEE under the current application of the Regulation on Environmental Assessment process.

50. The project activity would be classified as a Category C under the criteria of the *ADB Environmental Assessment Guidelines 2003* where there is no need for the preparation of an IEE.

51. Environmental monitoring in Vang Vieng will be the responsibility of the WREA provincial level with reporting to the national WREA office in Vientiane and the provincial governor's office of Vientiane Province. The WREA office has the experience of involvement in the implementation of the Small Town Development Sector Project. The key aspects of the monitoring should be to keep records of the (i) amount of waste removed (i) analysis of the waste material collected by broad categories by volume e.g. plastic, food, paper, cloth (ii) monitoring of the frequency of clean-up of the traps and (iv) the overall condition of the river environs (e.g. level of waste observed) up to 100m below the trap. It will be necessary for the river environs to be cleaned-up below the trap immediately after installation so as to provide a reasonable baseline for observing increased waste in the future.

52. Insofar, no environmental baseline data are collected by the provincial agencies in charge. The 5-years water quality monitoring program proposed under this project (**Annex 2**) is therefore regarded as an important step to secure the environmental integrity and biodiversity values of this region.

F. Public Consultation and Information Disclosure

53. The former IEE gives account on several public consultation activities, such as (i) 2 site visits by the former consultant team in July and September 2006. On each occasion meetings and site inspections were held with provincial representatives from STEA, Ministry of Tourism and the Ministry of Communication Transport Post and Construction in the Department of Housing and Urban Planning; (ii) in September 2006 a meeting was held with the Deputy Governor for the Vang Vieng District to discuss the project and priorities; (iii) a site walk was held with the Village Leader to confirm which sites were in public and private ownership. In summary the consultation indicated continuing support for the implementation of the Small Town Development Sector Project and that the proposed works would extend the benefits of the improvements to the towns drainage system and in particular, to help reduce the waste entering the Nam Xong.

54. An additional fact finding mission held during February 2008 involved on-site meetings with WREA, Ministry of Tourism and the Ministry of Communication Transport Post. In addition a meeting was also held with the WREA office in Vientiane to review and confirm environmental assessment processes.

55. The Environmental Team engaged for updating the IEE held several consultative meetings (October 2009 to March 2010) with the VV town planning agency, with the VV Water Board and with WREA. The latter consultation was primarily to set-up a water monitoring program for the Nam Xong River. For consultation purposes, the Environmental Team retrieved several new regulation documents regarding VV Urban Sanitation (**Annex 4**), and VV Urban Waste Management (**Annex 5**) and VV All documents are included in the current planning and monitoring. The original versions of these new regulations (in Lao language) are provided in the translation of this document.

56. The Director of VVUDA further mentioned that public consultation meetings were held on 24 October 2009 at various suburbs, providing information to stakeholders and the invited persons on the “Vang Vieng Drainage and Treatment Improvement Project”. This consultation was conducted with key persons from the village (B.Meuang Song), the Vang Vieng MPWT, the Land Management Authority, Tourism Office and var. technicians to announce and inform on plans for the urban drainages as well as treatment ponds in the wetland area adjacent to VV Meuang Song Primary School. However, details of the proposed construction have yet not been disclosed to all local villagers or concerned parties living in the respective area, and no technical drawings have yet been shown publicly.

57. During this field survey the Environmental Team also conducted an additional consultation meeting with the Schoolmaster of the Meuang Song Primary School. Details are provided in **Annex 6** and suggestions forwarded are incorporated in the EMP.

G. Findings and Recommendations

58. The overall goal of the project is to improve the general environmental situation in Vang Vieng urban areas. There are very limited environmental impacts associated with the proposed improvements to the drainage system in Vang Vieng. The initial screening of potential environmental impacts of the components indicates that they will not affect environmentally sensitive areas, nor will they cause medium or long-term changes in the physical, biological, and social environment. The proposed works are largely an extension of the works envisaged under the IEE prepared for the Small Town Development Sector Project that found no need for an EIA to be prepared. The proposed works are aimed at fixing existing environmental problems and this will also improve the capacity of the local area to sustain increased visitation in future years. Importantly these works are also aimed at providing better conservation outcomes for the Nam Xong water resources and the general living conditions of the local population.

59. The impacts associated with the proposed works are temporary and can be largely mitigated through the adoption of sound planning, design, construction and management practices at the sites.

60. None of the proposed components are considered to have significant environmental impact and do not require an EIA or EMP to be prepared to identify, assess and manage the potential impacts. However the environmental implications of the proposed development will need to be reviewed and monitored following site investigations and operational works. Record keeping of the waste collected, nature of waste and frequency of collection will help monitor the success of the project.

H. Conclusions

61. The proposed project essentially focuses on the overall improvement of current environmental problems, and a general enhancement of the local environmental conditions. The screening of all potential negative results resulted in only few minor impacts (**Annex 1**).

62. The proposed works will provide a range of positive environmental benefits for the community as well as for the visitors. It will not cause adverse environmental impacts. Most of the identified impacts associated with the proposed components and activities are manageable and are fully addressed in the Environmental Management and Monitoring Plan provided hereunder. It is therefore concluded that no EIA or further environmental baseline studies are required for implementing this project,

63. The environmental benefits accrued by this Project include (i) collection and reduction of stormwater waste that is currently polluting the Nam Xong, (ii) containing the illicit input of grey and black water (domestic sewage) from households located near urban drainage channels; (iii) improvement of the town authorities' capacities to collect waste and transport to the sanitary landfill site; (iv) to secure the environmental quality of Nam Xong River, and to obtain a scientific bases on possible public health warnings in case of severe river pollution incidents, and (ii) to support the litter awareness and education programs within the community, including the visitors to Vang Vieng tourist destinations.