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Year One Task Order One

2018 MALI
END OF SPRAY REPORT

SPRAY CAMPAIGN:
AUGUST 30 – OCTOBER 2, 2018

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2018 MALI END OF SPRAY REPORT

Spray Campaign:
August30 – October2, 2018

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ACRONYMS

ASACO	Community Health Association (<i>Association de Santé Communautaire</i>)
BMP	Best Management Practices
COP	Chief of Party
COR	Contracting Officer Representative
DNACPN	National Directorate for Sanitation and Pollution Control (<i>Direction Nationale de l'Assainissement, Contrôle de Pollution et de Nuisances</i>)
DOS	Directly Observed Spraying
DTC	Health Center Technical Director (<i>Directeur Technique de Centre de la Santé</i>)
ECO	Environmental Compliance Officer
IEC	Information, Education, and Communication
IRS	Indoor Residual Spraying
M&E	Monitoring and Evaluation
MOE	Ministry of Environment
MOH	Ministry of Health
NMCP	National Malaria Control Program
PID	Pulvérisation Intra Domiciliaire
PMI	U.S. President's Malaria Initiative
PNLP	Programme National de Lutte Contre le Paludisme
PPE	Personal Protective Equipment
PSDQA	Post-Spray Data Quality Audit
PSECA	Pre-Season Environmental Compliance Assessment
SEA	Supplemental Environmental Assessment
SOP	Spray Operator
UMAPLAST	Unité Malienne des Plastiques
USAID	United States Agency for International Development
VL	VectorLink project
WHO	World Health Organization

EXECUTIVE SUMMARY

The U. S. President’s Malaria Initiative (PMI) has been funding indoor residual spraying (IRS) in Mali since 2008 with the aim of reducing the malaria burden, especially among children under five years and pregnant women. In September 2017, USAID awarded Abt Associates a five year contract, called the PMI VectorLink (VL) project, with the overall goal to reduce malaria transmission via IRS, and thus contribute to the reduction of malaria-associated morbidity and mortality.

In 2017, PMI shifted IRS operations from the districts of Koulikoro, Baroueli, and Fana in the South of Mali to Mopti region in central Mali. This was based on data from a 2015 study showing the malaria prevalence rate in this region was 60 percent, compared to 30 percent nationally.

The objective of VL Mali in 2018 was to reduce malaria-associated morbidity and mortality in four districts of Mopti region – Mopti, Bandiagara, Bankass, and Djenné– by spraying 215,558 structures (67,417, 95,604, 26,998, and 25,539 respectively). Due to security issues, some initially targeted areas were dropped, and the IRS target was adjusted to 205,612 structures.

VL Mali implemented all activities with the involvement of the various levels of the Malian government. Highlights are shown in Table ES-I.

TABLE ES-I: VL MALI AT A GLANCE

Number of districts covered by PMI-supported IRS in 2018	4 districts: Mopti, Bandiagara, Bankass, and Djenné
Insecticide	Actellic 300 CS in Mopti and Djenné; SumiShield 50WG in Bandiagara and Bankass
Number of targeted structures, adjusted for security issues	205,612
Number of structures found by spray operators in 2018	167,598
Number of structures sprayed by spray operators in 2018	160,723
2018 spray coverage *	95.9%
2018 spray progress **	78.2%
Population protected by PMI-supported IRS in 2018	665,581 (20,992 pregnant women and 93,968 children under five)
Dates of PMI-supported IRS campaign	August 30 – October 2, 2018
Number of people trained with U.S. Government funds to deliver IRS***	824

* Spray coverage is defined as the proportion of structures sprayed out of structures found during the campaign before the insecticide ran out

** Spray progress is defined as the proportion of structures sprayed out of structures targeted

*** Based on the PMI indicator definition. It includes only spray personnel such as spray operators, team leaders, and supervisors. It excludes clinicians, data clerks, Information, Education and Communication mobilizers, drivers, washers, porters, pump technicians, and security guards.

Key lessons learned from the 2018 IRS campaign include:

- The implementation of IRS requires the involvement of all stakeholders at all levels, from the national level to the village level.
- The communication chain must be very clear and known to all relevant stakeholders before, during, and after the IRS campaign, especially in the ever-changing context of civil unrest.
- Radio broadcasts combined with live "call-in shows" were effective strategies for raising awareness and fighting rumors.
- The phased start of the campaign, due to the security situation and presidential elections, made it difficult to implement activities, particularly :
 - Updating logistics and monitoring and evaluation (M&E) data, while simultaneously supporting heightened logistical needs;
 - The redeployment of actors after a two-month period of uncertainty; and
 - The rapid mobilization of actors in the 36 health areas that started IRS 5 days after IRS had started in the first 10 health areas.
- The ban on the use of pick-up trucks and motorcycles for implementation was challenging due to limited mobility and additional logistical demands
- The project teams' 11 years of experience in IRS and strong relations with local stakeholders made it possible to overcome the difficulties and carry out IRS in spite of the security conditions.
- VL Mali experienced a shortage of insecticide toward the end of the IRS campaign due to higher-than-expected consumption of insecticide, because of the increased surface area made available to the spray operators within structures in 2018 compared to 2017. The shortage had negative consequences for the achievement of objectives. For subsequent IRS campaigns, insecticide quantification methods will be tailored to the circumstances experienced in each health area, and the supervision protocols (including increased accountability of supervisors) has been strengthened accordingly.

RESUME (EN FRANÇAIS)

L'Initiative du Président Américain contre le Paludisme (President's Malaria Initiative: PMI) a commencé à financer la Pulvérisation Intra Domiciliaire (PID) depuis 2008 avec le but de réduire le fardeau du au Paludisme spécialement au sein des Enfants de moins de 5 ans et des femmes enceintes. En septembre 2017, l'USAID a attribué à Abt Associates un contrat de cinq ans, appelé projet PMI VectorLink (VL), ayant pour objectif global de réduire la transmission du paludisme à travers la PID et de contribuer ainsi à la réduction de la morbidité et de la mortalité liées au paludisme.

En 2017, PMI a transféré les opérations IRS des districts de Koulikoro, Baroueli et Fana dans le Sud vers la région de Mopti suivant une étude conduite en 2015 montrant que le taux de paludisme dans cette région était de 60%, contre le niveau national de 30%.

Les objectifs de VL Mali en 2018 étaient de réduire les taux de morbidité et de mortalité liés au Paludisme dans les Districts sanitaires de Mopti, Bandiagara, Bankass and Djenné districts en aspergeant

215 558 structures (67 417, 95 604, 26 998 and 25 539 respectivement).¹ En raison de problèmes de sécurité, certaines aires de santé initialement ciblées ont été exclues, et la cible a été ajustée à 205,612 structures.

VL Mali a mis en œuvre toutes ces activités avec la pleine implication du Gouvernement Malien à tous les niveaux. Les résultats sont présentés dans le tableau ci-dessous (Table ES-2).

TABLE ES-2: VL MALI EN BREF

Nombre des districts sanitaires couverts par PMI en 2018	4 districts sanitaires: Mopti, Bandiagara, Bankass and Djenné
Insecticide utilisé pour la PID	Actellic 300 CS à Mopti et Djenné et SumiShield 50WG à Bandiagara et Bankass
Nombre de structures ciblées	205 612
Nombre de structures trouvées par les opérateurs	167598
Nombre de structures pulvérisées par les opérateurs en 2018	160723
Taux de couverture de la PID 2018 *	95,9%
Taux de progrès de la PID 2018 **	78,2%
Population protégée par PMI en 2018	665581 (20 992 femmes enceintes et 93968 enfants de moins de 5 ans)
Dates de la campagne financée par PMI	30 Aout au 02 October 2018
Nombre de personnes formées avec les fonds du Gouvernement des Etats Unis d'Amerique pour faire la PID***	824

* Le taux de couverture correspond au pourcentage de structures pulvérisées hors des structures trouvées.

** Le taux de progrès correspond au pourcentage de structures pulvérisées hors des structures ciblées.

* En se basant sur la définition des indicateurs de PMI. Ce chiffre inclut seulement les acteurs comme les Opérateurs, les Chefs d'Equipe et les Superviseurs. Il exclut les DTC, les agents de saisie, les mobilisateurs, les Chauffeurs, les lingères, les maintenanciers, et les gardiens.

Les principales leçons tirées de la campagne PID 2018 sont les suivantes:

- La mise en œuvre de la PID nécessite une bonne implication de toutes les parties prenantes à tous les niveaux, depuis le niveau national jusqu'au niveau village.
- La chaîne de communication doit être maintenue bien claire et connue de tous au cours d'une campagne PID et surtout dans un contexte d'insécurité, même si le projet sait que la situation sécuritaire n'est pas une donnée figée.
- Les émissions radiophoniques combinées aux "questions-réponses" téléphoniques sont des appuis importants pour la sensibilisation et la lutte contre les rumeurs.
- Le démarrage de la campagne en deux étapes, en raison de la situation sécuritaire et l'élection présidentielle a rendu difficile la mise en œuvre d'activités, particulièrement:
 - Mise à jour de la logistique et des données de suivi et d'évaluation, tout en répondant simultanément à des besoins logistiques accrus ;

¹ La cible initiale du plan de travail était 215 558 structures. Toutefois, en raison de l'insécurité, une aire de santé (Diambacourou), 12 villages et un hameau à Mopti, 2 villages et 13 hameaux à Bankass, 2 hameaux à Bandiagara et 3 villages à Djenné ont été exclus. L'objectif de la campagne PID a donc été ajusté à 205,612 structures.

- Le redéploiement des acteurs après une période d'incertitude de deux mois;
- La mobilisation d'acteurs non concernés par la première étape.
- L'interdiction de la circulation des pick-up et des motos est difficile en raison de la mobilité limitée et des exigences logistiques supplémentaires.
- Les onze années d'expérience de l'équipe de projet dans le domaine de la PID et les relations étroites avec les acteurs locaux ont permis de surmonter les difficultés et réaliser la PID malgré les conditions de sécurité.
- VL Mali a connu une pénurie d'insecticide vers la fin de la campagne PID en raison d'une consommation d'insecticide plus élevée que prévu à cause du nombre de pièces traitées par les SOPs qui était plus élevé en 2018 par rapport à 2017. La pénurie a eu des conséquences négatives sur la réalisation des objectifs. Par conséquent la méthode de quantification des insecticides pour la campagne PID suivante a été révisée pour prendre en compte les circonstances particulières de chaque aire de santé, et la procédure de supervision a également été révisée (surtout pour tenir les superviseurs responsables de leurs résultats).

I. BACKGROUND

The U. S. President's Malaria Initiative (PMI) has been funding indoor residual spraying (IRS) in Mali since 2008 with the aim of reducing the malaria burden, especially among children under five years and pregnant women. In September 2017, USAID awarded Abt Associates a five year contract, the PMI VectorLink (VL) project, with the overall goal to reduce malaria transmission in Mali via IRS and thus contribute to the reduction of malaria-associated morbidity and mortality.

Malaria is one of the leading public health problems in Mali, representing 32% of causes cited for medical consultation (SLIS, 2016) with 2,313,175 annual cases of malaria in health facilities and at community level (1,658,982 simple cases, 654,193 severe cases, and 1,344 deaths, with a case fatality rate of 0.05 per thousand). Children under five and pregnant women are the most biologically vulnerable members of the population, and IRS is a proven, effective vector control intervention used in Mali.

Starting in 2008, PMI has supported IRS in Bla and Koulikoro districts. In 2011, PMI added support for Baroueli district, thus making the IRS-supported area geographically contiguous. In 2012 and 2013, PMI continued spraying in the three districts with a carbamate class insecticide (bendiocarb). However, the results from 2013 monthly monitoring indicated that the residual efficacy of bendiocarb were short lived (about two months) in all the IRS districts, but particularly in Baroueli. As a result, in 2014, PMI switched to a long-lasting organophosphate insecticide (pirimiphos-methyl, Actellic300CS) in Baroueli and Bla districts; it continued to use bendiocarb in Koulikoro. In 2015, PMI and the National Malaria Control Program (NMCP) agreed to switch to Actellic 300CS in all districts. However, due to the high cost of the new insecticide and NMCP's planned implementation of a universal net coverage campaign in Bla district, only Baroueli and Koulikoro were targeted for IRS in 2015.

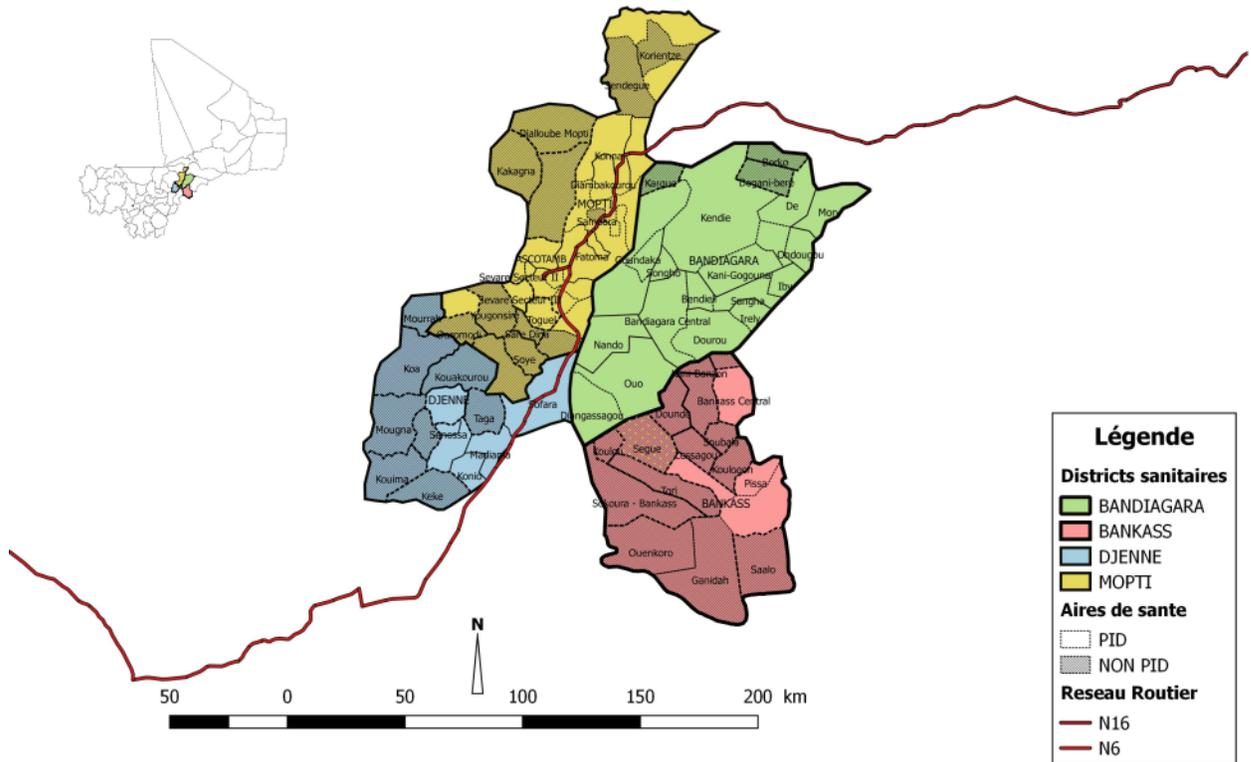
In 2016, Mali received support from the Next Generation Indoor Residual Spraying (NgenIRS) project, funded by UNITAID, which provides eligible countries with a co-payment on the price of long-lasting insecticides. As a result of the lower price of insecticide, as well as additional funding from PMI, the AIRS project in Mali was able to spray a third district (Fana) in addition to Baroueli and Koulikoro in 2016.

In October 2016, the NMCP and PMI decided to relocate IRS activities based on data from the Malaria Indicator Survey 2015, which showed the prevalence of malaria in the Mopti Region was 60 percent whereas the average prevalence in all other regions was 30 percent. In addition to its higher malaria prevalence, Mopti region does not benefit from the same level of malaria control resources as other areas. Thus, in 2017, AIRS relocated IRS operations to four districts of Mopti (Bandiagara, Bankass, Djenné, and Mopti). The same four districts were targeted for IRS in 2018, although 7 out of 53 health areas were excluded due to insecurity.²

In the end, IRS was conducted in a total of 46 out of 98 (47%) health areas across the four districts. Both Actellic 300CS and SumiShield 50WG were used in the 2018 IRS campaign. The 46 health areas targeted for IRS in 2018 are shown in Figure 1.

² IRS was initially planned in 47 health areas in 2018 (excluding 6 that were sprayed in 2017). Right before the campaign resumed in late August, district authorities advised the VL team not to spray in Diambacourou (Mopti) for security reasons. As a result, pre-IRS activities such as training included all 47 health areas, but only 46 were ultimately sprayed.

FIGURE 1: 2018 IRS CAMPAIGN DISTRICTS: BANDIAGARA, BANKASS, DJENNÉ, AND MOPTI



1.1 2018 IRS CAMPAIGN OBJECTIVES

As stated in the VL Mali2018 work plan, the program’s objectives in 2018 were to:

- Cover at least 85 percent of 215,558³ targeted eligible structures in 47 selected health areas (in four districts) and protect an estimated population of 772,376.
- Promote participatory implementation by the Ministry of Health (MOH) and NMCP at all levels during the implementation of IRS operations in the four districts.
- Continue developing national and local capacity in organizing, planning, implementing, and evaluating IRS campaigns.
- Support orientation and dissemination workshops regarding the application of national IRS strategic documents to the sub-regional levels.
- Complete quality entomological monitoring for the 2018 IRS campaign and collect data on insecticide resistance to inform insecticide selection for the 2019 spray campaign.

³ The original target in the 2018 Work Plan was 215,558 structures but 9,946 structures were ultimately excluded (including the entire health area of Diambacourou) for security reasons. Performance throughout this report was measured against the adjusted target of 205,612.

1.2 SUMMARY OF 2018 RESULTS

The following results respond to the 2018 objectives listed in Section 1.1:

- By the end of the 2018 spray campaign, VL Mali achieved 95.9 percent coverage (160,723 structures sprayed out of 167,598 found) and 78.2 percent progress (160,723 structures sprayed out of 205,612 targeted), protecting 665,581 people across the four districts.
- The project worked closely with government counterparts: district- and national-level partners participated in planning and scheduling of the IRS roll-out and sensitization of communities, and served as trainers, meeting facilitators, and supervisors during the campaign.
- VL Mali completed the post-spray meetings with the communities, and technical and administrative leaders in four districts from November 1 to 7, 2018.
- VL Mali conducted spray quality tests that indicated almost 100 percent mortality after spraying with both insecticide classes and continued to collect monthly data on insecticide residual life.

2. PREPARATION FOR IRS CAMPAIGN

2.1 IRS CAMPAIGN PLANNING

The following activities were undertaken to plan and organize the 2018 IRS campaign:

- Meetings with community leaders in Bandiagara, Bankass, Djenné and Mopti (March): These meetings included discussions about the dates for the IRS campaign and introductions to new approaches to implement IRS.
- Meetings with local partners (April): The project held meetings with sub-prefects, mayors, community health associations (ASACOs) and technical directors of community health centers (DTCs), and the chiefs of villages throughout the spray districts to ensure that communities were aware of the dates for IRS campaign implementation and to establish the roles and commitments of the ASACOs and DTCs in implementing the campaign.
- Internal IRS campaign planning (January–June): In January, the VL Mali team began detailed planning for all activities of the IRS campaign. VL Mali staff met regularly to review the progress of the campaign organization and planning. In these meetings, the team discussed revising training programs and materials, and setting standards for the campaign in accordance with PMI’s Best Management Practices (BMP) Manual. VL Mali inventoried IRS equipment and commodities leftover from the 2017 campaign, and procured local and international goods needed for successful implementation of the 2018 campaign.
- Meeting with IRS steering committee (February): All activities were planned and implemented in collaboration with government technical partners (NMCP, National Directorate for Sanitation and Pollution Control (DNACPN), Ministry of Environment (MOE), Ministry of Agriculture, and other government and non-government stakeholders) at the national, regional, district, and community levels. At this meeting, all key partners agreed on their roles as well as objectives, targets, and needs for the spray campaign.

2.2 INSECTICIDE SELECTION AND PROCUREMENT

Based on entomological monitoring and insecticide resistance results after the 2017 IRS campaign, both Actellic 300CS (pirimiphos-methyl) and Sumishield 50WG (clothianidin) were eligible insecticides to be used for IRS in Mali.

The target number of structures in the four spray districts was about 215,558 structures, which, divided by the average utilization rate of 2.8 structures per unit insecticide observed in 2017, would require a total of 76,985 units of insecticide.

VL Mali estimated that the 42,412 bottles of Actellic 300CS left over from the 2017 spray campaign would be sufficient to cover Bandiagara and Bankass, at that an additional quantity of insecticide was needed to cover Mopti and Djenné. Thus, Actellic 300CS was selected to spray Bandiagara and Bankass and SumiShield 50WG was selected for Mopti and Djenné. The total quantity of SumiShield 50WG procured was 34,573 sachets.

2.3 LOGISTICS PLANNING AND PROCUREMENT

2.3.1 INVENTORY ASSESSMENTS AND PROCUREMENT

Prior to the spray campaign, VL Mali did a full inventory in both central warehouses, located in Sevaré, for Djenné and Mopti districts, and in Bankass, for Bandiagara and Bankass districts. Using the insecticide inventory results and needs assessed for the 2018 campaign, VL Mali initiated international and local procurements. The local procurements involved an open, competitive tendering process. The VL Mali procurement committee selected suppliers based on the lowest-cost, technically acceptable bids that met the criteria given in the solicitation for the quotations. See Annex A for detailed lists of items procured locally and internationally and the post-campaign balance.

2.3.2 LOGISTICAL NEEDS ASSESSMENTS

During the internal planning meetings, the VL Mali team developed the logistics and commodities distribution schedules for the 2018 IRS campaign. On July 6, VL Mali suspended all activities and all commodities (insecticide and personal protective equipment [PPE]) were transported back from secondary stores to central warehouses in Sevaré and Bankass. At the end of August, the he operations manager, logistics coordinator, and environmental compliance officer (ECO) finalized the plans for moving IRS commodities to all 47 operational sites on August 24–30, 2018. Table 1 shows the quantities of key IRS commodities distributed to each district for the spray campaign, and Table 2 shows the vehicles used to transport spray operators (SOPs) and supervisors to the spray sites. Annex B includes details of vehicle usage in four districts in 2018.

TABLE 1: DISTRIBUTION OF SELECTED IRS COMMODITIES TO OPERATIONAL SITES

Operation Sites	Number of Teams	Overalls	Boots (Pair)	Helmets	Spray Pumps	Gloves	Masks / Respirators
Mopti	48	733	402	292	258	760	11430
Djenné	17	256	136	113	91	512	4100
Bandiagara	61	865	426	367	361	606	15040
Bankass	17	223	123	115	93	143	2640
Total	143	2,077	1,087	887	803	2,021	33,210

TABLE 2: DISTRIBUTION OF VEHICLES

District	Minibuses*	Hard-top 4x4**	Taxini***	Horse Carts****
Mopti	14	05	36	0
Djenné	08	03	0	0
Bandiagara	17	16	0	10
Bankass	05	06	0	0
Total	44	30	36	10

* Minibuses are used for SOP transportation over flat terrain with more or less standard road access.

** Hard-tops are used in accident-prone geographical areas for transport of SOPs and supervisors (project and partners).

***Taxinis are three-wheeled vehicles with a motorbike incorporated. They are cheaper than the other vehicle types, and more flexible for use in geographical areas with narrow roads. They are used to transport SOPs.

**** Due to the ban on motorcycle traffic, the project was forced to use horse carts in some places.

2.4 HUMAN RESOURCES

To implement the 2018 IRS campaign, VL Mali hired 2,622 seasonal staff, which included 2,049 men and 573 (21.9%) women. Table 3 provides a breakdown of the seasonal staff by position and gender.

TABLE 3: SEASONAL STAFF HIRED IN 2018, BY POSITION AND GENDER

Position	Men	Women	Total
District logisticians	4	0	4
District supervisors	3	0	3
Data clerks	2	14	16
Pump mechanics	13	1	14
mHealth coordinator	1	0	1
IRS data transporters	11	1	12
Spray operators	547	79	626
Community supervisors	47	8	55
Team leaders	125	18	143
Storekeepers	35	11	46
Washers	0	115	115
Mobilizers	1054	318	1372
Entomological technicians	12	3	15
Security guards	85	5	90
Drivers	110	0	110
Total	2,049	573	2,622

A selection committee was set up in each of the 47 health areas (Diambacourou health area was excluded at the beginning of the campaign for security reasons) to select and recruit seasonal workers. Each committee was composed of the Sub-Prefect (president of the committee and representative of the prefect), the mayor, the DTC, the president of the ASACO, and the village chief.

The selection committee in each spray area recruited SOPs, team leaders, pump mechanics, and washers based on criteria developed by the VL Mali technical team. In addition to being over the age of 21 and speaking the appropriate language for the area, hiring criteria for SOPs included: 1) ability to read and write, 2) ability to carry spray pumps for several hours per day, and 3) a certified note from a doctor stating that the candidate was in good health. The DTCs gave all SOPs a medical exam at the health post, a process that VL Mali supervised closely. The DTC notifies by a certificate that the woman being tested is not pregnant.

FIGURE 2: SPRAY OPERATORS TEAM



SOP team in Djenne district.

SOP team in Mopti district. At right (in white T-shirt) is VL Mali's gender focal point, visiting the SOPs during the IRS campaign.

2.5 TRAININGS

VL Mali held 13 different trainings to ensure that all seasonal staff were aware of their roles, understood how the IRS campaign would function, and had the technical knowledge and skills to perform their jobs well. The trainings also covered what to do in emergency situations (such as insecticide poisoning), and reinforced the value of preventing malaria transmission. Brief descriptions of trainings are in Annex C. In addition to technical trainings on roles, responsibilities, and techniques, all spray team members (SOPs, team leaders, supervisors, washers, and storekeepers) were trained on the safe utilization of Actellic 300CS and Sumishield 50WG, and other best-practice management of pesticides including the use of PPE during operations. They also received instructions on the use of spill kits and first aid kits.

Spray teams and drivers hired to transport IRS commodities received training on correct methods to secure and safely handle insecticides. Participants also learned how to manage an insecticide spill, use a fire extinguisher, and safely clean vehicles after each day of the IRS campaign.

All the trainings were implemented with the support and involvement of government technical partners. The trainings took place between June 21 and July 6, 2018 in the district capitals, at which time security concerns forced the trainings to be interrupted, just two days before the 2018 IRS campaign was originally scheduled to begin. A week after the final result of the presidential elections was announced, VL Mali held the final two days of training (August 28-29). Further details on campaign postponement are provided in section 2.6 of this report. As Table 4 shows, VL Mali trained 2,702 people in total, 585 (21.65%) of whom were women.

FIGURE 3: TRAINING OF TRAINERS IN SPRAY TECHNIQUE



The practical session, simulations of insecticide application in Sevaré (Mopti District), June 24–25 2018

TABLE 4:SEASONAL STAFF TRAINED, BY TOPIC AND GENDER

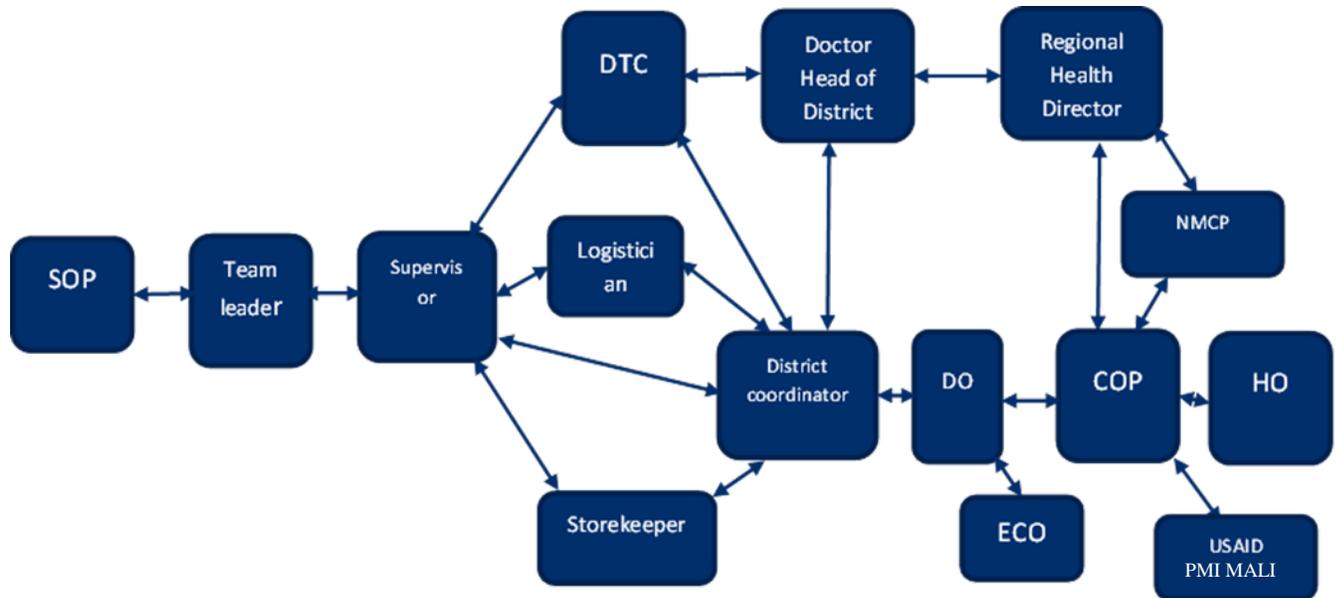
Categories of Persons Trained	Training on IRS Delivery								Other Trainings																Total		
	Training of Trainers		Spraying Operations		Intoxication Management		Supervisors Training		Data clerks Training		Logistics Training		Washing Training		IEC Training		Transport safety and security		Store security Training		Logistics Training		Entomology Training			IEC Training	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		M	F
DTCs	39	7																									46
District coordinators	4	0																									4
*Spray operators			547	79																							626
*Team leaders			125	18																							143
Clinicians					39	7																					46
*Community supervisors							47	8																			55
Data clerks									2	14																	16
Storekeepers											35	11															46
Washers													0	115													115
Mobilizers															1,054	318											1,372
Drivers																	110	0									110
Security guards																		85	5								90
District logisticians																					4	0					4
Warehouse keepers																				2	0						2
Entomologist technicians																							12	3			15
Radio hosts																									12	0	12
TOTAL M/F District	43	7	672	97	39	7	47	8	2	14	35	11	0	115	1,054	318	110	0	85	5	6	0	12	3	12	0	2,702
Total Trained	50		769		46		55		16		46		115		1,372		110		90		6		15		12	2,702	

*Based on the PMI indicator definition. It includes only spray personnel such as SOPs, team leaders, and supervisors. It excludes clinicians, data clerks, Information, Education and Communication (IEC) mobilizers, drivers, washers, porters, pump technicians, and security guards.

2.6 SECURITY

The VL Mali team received a security training in Bamako on June 8, 2018, which covered preventive measures, communication plans, and situation management and response. A robust communication chain was developed as a result of this training to ensure lines of communication were clear and efficient. The communication chain is depicted in Figure 4.

FIGURE 4: THE VL MALI TELEPHONE COMMUNICATION CHAIN



The 2018 Mali IRS campaign was originally scheduled to begin on July 9, 2018. Due to the increasing frequency of security incidents within the IRS target area leading up to and following the July 20th presidential election, VL Mali suspended all activities including SOP training starting on July 6, 2018. All IRS actors were temporarily dismissed and all commodities (insecticide and PPE) were transported back from secondary stores to central warehouses in Sevaré and Bankass.

On August 24, 2018, one week after the final election results had been officially announced, the VL Mali team resumed training and pre-campaign activities. At that time, community leaders in the Diambacourou health area (Mopti district) informed the project that threats to security would make it unwise to carry out IRS there. Thus 4,430 structures of Diambacourou were excluded from the 2018 target. After this exclusion, the target was reduced to 211,128 structures across 46 health areas. An additional 5,516 structures were excluded during the campaign for security reasons.

3. IEC ACTIVITIES

With the experience of 2017 during which the combination of bad weather conditions and low perceived benefits of IRS had resulted in refusals (1.72% of structures in 2017 versus 1.64% in 2018), the project invested a lot in the communication and mobilization efforts, in collaboration with local authorities, which helped increase the rate of acceptance this year. The VL Mali team found, however, that empirical evidence of IRS effectiveness in 2017 was a significant driver of acceptance in 2018 and led beneficiaries to seek out IRS and, in some cases, pressure the spray teams to apply more insecticide than is recommended by the PMI BMP Manual. These misconceptions will be further explored and managed in preparation for the 2019 IRS campaign.

VL Mali completed the following information, education, and communication (IEC) activities in 2018:

3.1 COMMUNITY MOBILIZATION

In 2018, VL Mali hired formal mobilizers. The project entrusted the DTCs with identifying the best mobilizers in each village, from among those with whom they are used to working in other health domains. Field supervisors, village chiefs, and public criers also were responsible for mobilizing the communities before and during the campaign.

IEC mobilization activities began 20 days prior to the campaign with radio announcements and community meetings. One day before the arrival of the spray team, the field supervisor or the DTC called the village chief to advise him of their arrival. The IEC mobilizers then informed or announced the news to the community. VL Mali complemented this with announcements on community radio stations, which continuously broadcast the spray schedule to the different villages.

In the Socoura Health Area of the Mopti Health District, supervisors used megaphones for mobilization before and during spraying. With this initiative, Socoura had the highest IRS acceptance rate and this approach will be replicated in subsequent years.

3.2 RADIO BROADCASTS

Because radio is widely available and listened to in the spray districts, VL Mali used radio broadcasts to ensure wide dissemination of IRS spray campaign information. It worked with 12 local radio stations to broadcast 7,560 radio spots in French, Bambara, Fulfulde, and Dogosso to promote the IRS campaign. Radio programs were also broadcast with announcements about the spray schedule, call-in shows, and live interviews with VL Mali and District Health Center staff, DTCs, community leaders, spray campaign beneficiaries, and SOPs during the spray campaign.

4. IMPLEMENTATION OF IRS ACTIVITIES

4.1 APPROACH

In previous years, the IRS campaigns began in the most remote areas and worked their way toward the more central areas. In 2018, the team modified their approach in response to the security conditions and began operations first in the 10 most central health areas (7 in Mopti ville and the 3 other district capitals) on August 30, 2018. This approach simultaneously minimized risk to the teams in the first days of the campaign, and also allowed teams to cover maximum structures in the most densely populated areas in the event of a security-related interruption. After two days of smooth implementation, and after consulting with the local health authorities, the VL leadership team deemed that 36 (142,937 structures) out of the 37 remaining health areas were stable enough to begin IRS operations, and did so on September 4, 2018.

The 2018 IRS campaign was implemented for 34 operational days (August 30-October 2) in the first 10 urban health areas of the four health districts, and in 29 operational days (September 4-October 2) in the other 36 health areas. VL Mali deployed a total of 143 spray teams from 46 sites.

The allocation of spray teams was determined by the number of eligible structures per district and the geography/terrain that the spray teams would cover (Table 5). Considering the generally larger structures found in Mopti and Djenné, logistical planning estimated that each SOP would spray nine structures per day. In contrast, in Bandiagara and Bankass, SOPs were expected to spray 12 structures per day. This is why VL Mali scheduled the same number of spray teams for Bandiagara and Mopti, despite them having different numbers of target structures.

TABLE 5: DISTRIBUTION OF SPRAY TEAMS BY DISTRICT

District	No. of Spray Teams	No. of Eligible Targeted Structures
Bandiagara	61	95,344
Bankass	17	24,948
Djenné	17	24,328
Mopti	48	60,992
Total	143	205,612

Spray teams consisted of five or six SOPs per team leader. During the spray campaign, each operational site had a storekeeper, guards, and washers. Spray operations began at 6:00 am, when the spray personnel met at their designated operational sites (after eating breakfast) to collect their equipment (PPE, tanks, and insecticide) and get ready for the day. Once all commodities were distributed, the supervisor met with the spray team leaders, shared the spray schedule for that day, and their route to reach each community.

Prior to the departure, the teams consistently verified:

- State of vehicles;
- Availability of phone numbers of all teams members (SOP, team leader, supervisor, storekeeper, DTC, etc.);
- State of roads and/or rivers;
- Departure time and duration of travel; and
- Assembly point in case of danger.

The spray teams departed the operational sites for the communities by 7:00 am to carry out spraying, and they returned around noon or 1 pm. Upon arrival, the SOPs lined up by the soak pit to progressively rinse their spray tanks and then remove their coveralls and PPE for washing. Team leaders returned all insecticide bottles/sachets (both empty and unused bottles/sachets) to the site storekeeper. The storekeeper counted/verified the number of empty bottles/sachets against the number of bottles/sachets reported having been issued; the storekeeper then placed the empty bottles/sachets in their original boxes and stored them in a designated area of the storeroom to await transport to a recycling facility after the IRS campaign. The unused bottles/sachets were returned to the available stock-on-hand and were distributed the following day following the PMI policy of “first-expired first-out.”

IRS district teams, consisting of a district coordinator, central warehouse manager, logistician, monitors, and pump technicians, in close collaboration with the DTCs, provided oversight to achieve VL Mali’s goal of providing day-to-day operational management and support for IRS implementation, including all aspects of monitoring and quality assurance for spray operations. Further details on supervision protocols are provided in section 4.4 of this report.

4.2 SECURITY ISSUES

In addition to the exclusion of one of 47 health areas (Diambacourou) before the campaign even started, DTCs advised the VL team not to visit certain villages and hamlets due to unstable security conditions, resulting in the mid-campaign exclusion of an additional 5516 structures from the target. The project requested that DTCs put these advisories in writing (see Annexes D).

Table 6 lists the villages and hamlets that were excluded from the IRS target area.

TABLE 6 : VILLAGES NOT SPRAYED DUE TO SECURITY CONCERNS

Health District	Health Area	Village	# Structures excluded	
Mopti	Komoguel	Kobaka	484	
		Sampara	Beri	43
			Tepawal	74
			Seguebougue	165
			Tomborguel	53
			Ouro-Nema	151
			Degou	183
			SareHamadi	155
			Deguena	173
			Kanguela-OuroNelbel	131
		Tongorongon	Poucchi	52
		Fatoma	Sabe	287
			Guirowel	393
Bandiagara	Iby	IbyDamato-Gorogondou	6	
		NeniOgorou-Boudigue	254	
Bankass	Pissa	LibeHabe	624	
		LibePeulh	380	
		Pissa-Senetiti	17	
	Niamia	Niamia-Wosse	257	
		Niamia-OuroEme	30	
		Niamia-Toue	63	
		Niamia-Djolahiri	82	
	Baye	Gondiedougou-LibeYara	7	
		Gondiedougou-Korossagou	330	
		Gondiedougou-KamleFitini	17	
		Gondiedougou-Doulinbougou	32	
Baye-Debe		56		

Health District	Health Area	Village	# Structures excluded
Djenné	Sofara	Baye-Siry	13
		Baye-Nematoulaye	4
		Gouere-Bissan I	138
		Kounti Bambara	108
		KountiMarka	412
		KountiPeulh	34
		N'dobougou	308
TOTAL			5,516

4.3 INSECTICIDE SHORTAGE

The 2018 IRS campaign experienced a shortage of the insecticide stock, which led to premature termination of the spraying operations. The planned amount of insecticide was 76,985 units, which were fully consumed before the end of the campaign (34 operational days in 10 health areas and 29 operational days in 36 health areas). The insecticide needed to complete spraying of the remaining 38,363 target structures was an estimated 14,368 units of insecticide.

Over-consumption of insecticide was detected by the M&E team through information from the project database. This database is fed by the daily SOP data collection form with information on the number of structures treated and the consumption of insecticides. Physical verifications, interviews, and data analyses conducted by the team revealed that there were two primary causes of over-consumption: 1) an increase in the number of rooms per structure that beneficiaries wanted sprayed, and 2) double-spraying of structures due to a perception that this would increase IRS effectiveness.

The Warehouse Managers responsible for managing the insecticide stock also have a stock management application that allows them to track commodity balances in real time. This application is powered by information sent by SMS from secondary storekeepers for the primary purpose of detecting missing insecticide or other U.S. government property. However, the warehouse managers and site-level storekeepers do not exchange information on the number of structures remaining to be sprayed in relation to the stock of insecticide available to them. While the same information that the M&E team tracks through the SMS-based Performance Management Tracker (PMT) was displayed at each site through a performance tracking sheet, warehouse managers were not expected to monitor insecticide consumption relative to spray progress through this system. Through this experience, the team has learned that more cross-sectional monitoring is necessary and will be enforcing daily reconciliation meetings between site leadership (including store keepers) to ensure all aspects of the campaign are progressing at the expected pace.

The inventory tracking systems are different in that the information collected by the M&E system is less recent compared to that of the warehouse Managers which is updated in real time. This discrepancy is explained by the fact that the SOP data collection form reaches the data entry center with an average of two days delay. On the other hand, the real-time information on the SOPs' use of insecticides often suffers from errors. In contrast, the M&E team uses more reliable and up-to-date central warehouse information to reconcile insecticide use. When this information was analyzed in conjunction with the spray campaign progress, it was possible to detect overconsumption. In 2019, with the introduction of the DHIS2 instance for data collection in Mali, the utility of the SMS-based Performance Management Tracker (PMT) will be reconsidered in light of how unreliable it has been in the context of Mopti region.

4.4 SUPERVISION OF IRS

VL Mali deployed 55 field supervisors to monitor spray operations (one supervisor for four teams) through Directly Observed Spraying (DOS) in randomly selected villages using phone-based inspection

forms. In addition to monitoring the work of the spray teams, they managed the logistics of vehicles traveling to and from spray sites. The supervisors, in turn, were supervised by the DTC and the district coordinator. The DTC's role was to provide oversight during morning mobilization and when the spray teams were cleaning-up at the end of each day. Information on the number of supervisory inspections is included in Annex E.

Prior to the 2018 campaign, the VL Mali team sensed that they had developed too many supervisory tools to keep track of. The team streamlined the forms this year, which meant that supervisors' targets were reasonable. They continued to carry out national, regional, and district-level supervisions.

4.4.1 DIRECTLY OBSERVED SPRAYING

As in 2017, the 2018 campaign employed DOS, in response to growing concerns about spray quality and the level of supervision by team leaders observed in some VL countries. Equipped with an 11-question checklist, each team leader had to observe each of the four SOPs on their team once per day and record the results on the spot. The DOS form prompts Team Leaders to observe mixing, spray techniques (distance, speed, etc.), household marking, and provision of instructions to the household. A DOS would detect a case of overdosing during mixing but no cases of overdosing were reported under supervision. Similarly, no cases of double-spraying were reported under supervision, suggesting either that it did not occur during DOS, or that the team leaders did not perceive double-spraying as problematic. A data transporter delivered these paper records to the data entry center every day for entry in a database. At the end of each week, the database manager produced the table of results, and the M&E manager produced a report that he shared with the operations manager, district coordinators, and the home office team for corrective feedback on the ground. For example, 5.6 percent of Goizper pumps had leaks in Mopti during the first two weeks of the campaign; this rate was reduced to 4percent in the third week as a result of DOS. Only the highest cadre of supervisors used electronic supervision forms in 2018 because in 2017 the community supervisors, who are recruited on the basis of their community status and not on technological proficiency, has experienced signification challenges with the forms that lead to the Abt staff verifying a huge amount of false incidents.

4.4.2 CHALLENGES TO SUPERVISION

The changing security situation in some health areas had an impact on supervision for two primary reasons. First, several health areas and villages could not be properly supervised due to insecurity; community members themselves discouraged IRS supervisors from visiting certain areas. Second, the staggered start of the campaign, as a preventative approach, led to a heavy workload for the team and compromised the frequency and quality of senior level supervision as they managed competing priorities (routine IRS supervision in 10 health areas, while simultaneously rounding up personnel and completing training for the 36 other health areas and active surveillance of the security status of all 44 areas).

4.5 STOCK MANAGEMENT DURING THE IRS CAMPAIGN

Standard good management of the stock of PPE, and specifically the insecticide inventory, is a major priority during an IRS campaign. The warehouse managers, DTCs, supervisors storekeepers are responsible for ensuring accurate and updated (twice daily) records of the physical balance are recorded at every stage before, during, and after the campaign including procurement, transportation, storage, and issue of products to spray teams to ensure no items are missing or unaccounted for. This systems allows storekeepers at the store level to prevent stock outs at the store level by tracking balances and submitting requests for supplemental inventory.

4.5.1 ELECTRONIC INVENTORY MANAGEMENT

As in the three past years, Vector Link Mali continue in 2018 to use the software to electronically manage the movement of insecticide between the district warehouse and secondary stores at each operational site. The warehouses managers in Sevaré and Bankass use a Microsoft Access-based inventory database. At the end of each spray day, every operational site storekeeper sends a text message to the central warehouse managers, reporting the number of bottles or sachets consumed and the remaining full bottles and sachets. The district warehouse managers compile this information into a database to produce a daily summary, which is used to predict any site stock-outs and re-supply that site before the stock-out occurs.

The M&E team is continually working on ways to improve the system and disseminate it for use in other VL countries.

4.5.2 INVENTORY MANAGEMENT AT OPERATIONAL SITE LEVEL

Each Actellic 300CS bottle or sachet of Sunshield 50WG was tagged with an individual serial number and the concerned district's initials to complete the stock inventory.

VL Mali recruited four seasonal district logisticians for the IRS campaign to liaise between the 46 operational site storekeepers and the two district warehouse managers. The logisticians coordinated supply chains to move needed IRS materials to the appropriate operational site, and to ensure the accuracy and correct use of stock cards for inventory record-keeping. The district logisticians regularly checked with storekeepers regarding their stock levels and arranged the transport of commodities from the district warehouses to the operational sites as needed, although it was not in their purview to enforce adherence to the expected insecticide consumption rate.

Every morning during the spray campaign, the team leaders, with the storekeepers, organized, distributed, and issued all PPE to be used for the spray operations. The storekeepers also organized and distributed PPE to the washers and other IRS staff as needed. At the end of each day, the SOPs gave the PPE to the washers for cleaning. After the PPE was washed, the washers returned it to the storekeepers and team leaders, who did another inventory to ensure that all PPE were returned and accounted for.

Every morning, at each operational site, storekeepers issued Actellic 300CS bottles and/or SumiShield 50WG sachets to team leaders, who signed an insecticide tracking card to acknowledge receipt of the bottles or sachets on behalf of their team; the cards noted the bottles' and/or sachets' serial numbers for further tracking, if needed. The team leader also noted on a separate card the number of bottles/sachets provided to each SOP and the serial number of each bottle or sachet distributed.

At the end of each spray day, SOPs turned in their used and unused bottles/sachets to the team leader, who consolidated and returned them to the site storekeeper. The storekeeper recorded the returned full bottles on the stock card as a positive adjustment and updated the stock balance. The used bottles were registered on a daily utilization record form that helped VL Mali calculate trends in insecticide use.

Additionally, the storekeepers prepared a comprehensive weekly stock report and submitted it first to the district logisticians and then to the VL Mali logistics and procurement coordinator. This person generated and aggregated the total stock balances for the IRS campaign to identify where PPE and/or insecticide was needed, then made a quick plan to send the identified needs from the district warehouses to prevent stock-outs.

Mid-way through the campaign, the district logisticians completed a physical inventory in each operational site in their districts and reconciled the physical counts with the warehouse inventories. The VL Mali logistics and procurement coordinator reviewed these mid-campaign inventory balances and used them to send the needed IRS commodities to each site during the second half of the campaign.

5. MONITORING AND EVALUATION

All M&E activities and processes for the 2018 IRS campaign closely followed the processes outlined in the 2018 PMI VL Project Work Plan and the M&E Concept Paper developed by the VL core team. M&E activities, under the supervision of the Chief of Party (COP), were led by the VL Mali M&E manager and the database manager. The database manager updated the existing secure and reliable Microsoft Access database to reflect minor changes to the 2018 VL M&E system, and deployed the database to the data entry center in Mopti (Sevaré). Sixteen data entry clerks worked in the data center (Figure 5), which received data from Bandiagara, Bankass, Djenné, and Mopti districts. One clerk was responsible for entering DOS data.

5.1 KEY OBJECTIVES

The key objectives of VL Mali M&E activities are to:

- Verify the accuracy of both the data collection and data entry processes through comprehensive training and supervision at all levels;
- Streamline and standardize data flow, minimize errors, and facilitate timely reporting;
- Ensure IRS data security and storage for future reference through the establishment and enforcement of proper protocols; and
- Document lessons learned and good practices observed in the implementation of the project activities and apply these to future project years.

5.2 DATA MANAGEMENT

The VL Mali team made revisions to the data collection process to reflect the updates to the VL Mali M&E system for the 2018 spray campaigns. As noted above, all updates were incorporated into the Access database to ensure accuracy and consistency of data entry and reporting.

FIGURE 5: DATA CLERKS IN SEVARÉ DATA CENTER



For quality control and the timely generation of weekly progress reports, data clerks in Sevaré entered spray data into the database usually within 24–48 hours of spray. In some cases, data entry took 2–3 days because the additional time needed for delivery of data collection forms from distant health areas in Bandiagara, Bankass, and Djenné districts. Many villages are difficult to access because poor road conditions, insecurity, and/or rain prevented the data transporter from transporting data collection forms from traveling to/from the health areas on

schedule. VL Mali used a daily data tracking chart to alert district coordinators if the data were expected to arrive late. This practice was extremely effective in reducing the delivery time of the forms.

Once the data were entered, paper forms were filed and temporarily archived at the data center. Eventually, all the forms were transferred to the VL Mali office in Bamako for long-term storage. A daily electronic back-up of the data was saved to the VL Mali server and to an external hard drive for data safety. The project shares with Home Office the extracts (Excel format) from the two master tables (Structures and Insecticides) with each weekly report sent.

5.3 DATA QUALITY ASSURANCE AND QUALITY CONTROL

Data quality assurance was carried out daily during the IRS campaign by a variety of VL staff (SOPs, team leaders, Supervisors, Data transporter, district coordinators, M&E manager and database manager). Specific activities conducted to ensure data quality included physical data verification at three distinct levels:

- SOP level: Team leaders and the supervisors reviewed, arithmetically verified, and signed off on all Daily Spray Operator Forms.
- District level: District coordinators received the paper forms from the supervisors and checked the accuracy of the spray data with the Error Eliminator Form. This form allows one to check the quality of the data and the overall completeness of the form, itself. Afterward, the monitors delivered the Daily Spray Operator Forms to the data center each evening.
- Data entry level: Data clerks reviewed each form for typos and transcription errors and verified the arithmetic calculations on the Daily Spray Operator Forms were correct before entering them into the database. Also to check the quality of the data entered, the project uses the data entry verification form to verify the accuracy of the data at the point of data entry. This process is done six times for each data clerk.

5.4 M&E DATA QUALITY ASSURANCE TOOLS AND RESULTS

VL Mali used three data quality assurance tools, which focus specifically on data quality assurance methods. After some initial struggles due to the conversion of the data collection verification form from paper to a form on a mobile application, the users learned how to navigate the form on a smartphone. Table 7 shows the percentage of records verified by VL Mali in 2018 using each data quality assurance tool.

TABLE 7: TYPES OF M&E SUPERVISORY TOOLS USED AND DATA CHECK RESULTS

M&E Supervisory Tools	Structure Records Verified	Structure Records Corrected	Percent of Records Correct
Error Eliminator	18,614	2,420	87%
Data Collection Verification	6,874	1,031	85%
Data Entry Verification	2,080	208	90%

5.5 RESULTS

The complete list of all program indicators for the 2018 spray campaign is presented in the M&E Plan matrix in Annex F. The following sections provide summaries on the core PMI indicators and other spray indicators.

5.5.1 SPRAY COVERAGE AND PROGRESS

The 2018 VL Mali campaign sprayed 160,723 of the 167,598 structures found by spray operators, for a spray coverage of 95.9 percent. Despite considerable security challenges as well as logistical constraints (unique architecture, refusals to remove belongings from structures, and early rains causing poor road conditions) and the insecticide shortage, VL Mali was able to achieve a spray progress of 78.0 percent (160,723 sprayed out of 205,612 targeted). In total, 665,581 people were protected, including 20,992 pregnant women and 93,968 children under five, as seen in Table 8.

TABLE 8: SPRAY COVERAGE AND POPULATION PROTECTED

District	Eligible Structures Found	Structures Sprayed	Spray Coverage	Population Protected				
				Males	Females	Total	Children <5	Pregnant Women
Bandiagara	64,970	63,296	97.4%	117,368	116,397	233,765	35,910	6,059
Bankass	20,210	19,561	96.8%	37,356	34,400	71,756	10,957	1,333
Djenné	22,160	21,652	97.7%	47,057	44,201	91,258	12,976	3,119
Mopti	60,258	56,214	93.3%	136,510	132,292	268,802	34,125	10,481
Total	167,598	160,723	95.9%	338,291	327,290	665,581	93,968	20,992

5.5.2 INSECTICIDE USAGE

Table 9-A shows insecticide availability and use in 2018. In total, 76,985 bottles/sachets of insecticide were used to spray 160,723 structures. Table 9-B shows usage of each insecticide and by district in 2017 and 2018.

In 2019, the insecticide quantification process will account for the variability in size and complexity of structures in the target area, as well as historical insecticide utilization data.

TABLE 9-A: INSECTICIDE USAGE DURING THE 2018 IRS CAMPAIGN

Insecticide	Balance (Units)
Actellic 300CSbalance before the spray campaign began	42,412
SumiShield 50WG procured for the 2018 campaign	34,573
Total number of insecticide bottles/sachets available for 2018 campaign	76,985
Actellic 300CSbottles and SumiShield 50WG sachets used during the 2018 IRS campaign	76,985
Balance after the completion of the campaign	0

TABLE 9-B: INSECTICIDE USAGE BY DISTRICT IN 2017 AND 2018

District	2018 (Actellic and Sumishield)			2017 (Actellic only)	
	Actellic (bottles)	SumiShield (sachets)	Spray progress	Actellic (bottles)	Spray progress
Bandiagara	31,905	1,380	66.39%	35,754	87.67%
Bankass	9,642	840	78.41%	8921	95.95%
Djenné	193	9,144	89%	10,437	93.37%
Mopti	672	23,209	92.17%	16,876	91.48%
TOTAL	42,412	34,573	78.17%	71,988	90.66%

During this campaign, there was a stock-out of insecticide, which forced a premature cessation of the campaign, as described in section 4.5.3. Relative to the adjusted target of 205,612 structures, an estimated 54,835 structures remained to be sprayed.

6. ENVIRONMENTAL COMPLIANCE

6.1 ENVIRONMENTAL DOCUMENTATION

VL Mali operates under a Supplemental Environmental Assessment (SEA) that was written and approved in 2016. The SEA covers the use of all World Health Organization (WHO)-recommended insecticides for IRS, including pyrethroids, carbamates, organophosphates, and chlorfenapyr, a pyrrole, for the period of 2016-2021. The SEA is valid for IRS activities nationwide, which includes the four districts of Bandiagara, Bankass, Djenné, and Mopti.

This SEA was amended and approved on July 2, 2018, with the introduction of clothianidin, a neonicotinoid.

The transfer of IRS activities to a new region, Mopti, required an Environmental and Social Impact Assessment, which was completed and approved in April 2017. The permit was obtained on June 29, 2017.

6.2 INTRODUCTION OF INSECTICIDE ROTATION

The 2018 campaign was the first year of SumiShield50WG use in Mopti and Djenné districts, which previously had been sprayed with pirimiphos-methyl only (in 2016 and 2017) and previously with bendiocarb only (from 2011 to 2014). Because of the introduction of an insecticide rotation strategy (two insecticides in use during the same campaign and potential rotation in future years to mitigate the risk of developing insecticide resistance), the district received special attention in terms of training, inspection during the campaign, end-of-day clean-up, and PPE supply to ensure both personnel and beneficiaries would perceive the two insecticides as equally effective with equivalent safety and risk profiles, and to avoid potential insecticide exposure of spray teams and residents. To reinforce the management process for empty sachets, storekeepers were instructed to re-count the empty sachets before reclassifying them in their boxes when receiving them from team leaders. This check was in addition to that performed by supervisors and team leaders in the field.

6.3 MOBILE SOAK PITS

Based on the difficulty of installing fixed soak pits due to hard and rocky soil in some health areas, mobile soak pits were used again in four health areas in the Bandiagara health district: Mory, Kamba, Djiguibombo, and Kori-Maoundé. Health areas in Bankass, Djenné, and Mopti used a combination of fixed and mobile soak pits to allow spray teams to conduct multi-day missions and avoid excessive transportation.

Twelve mobile soak pits (MSP) were used this year in Mali. The use of the mobile soak pits helped VL Mali to continue improving its environmental and safety compliance, time management, cost efficiency, and SOP convenience during the campaign.

6.4 PRE-SEASON ENVIRONMENTAL COMPLIANCE ASSESSMENT

In accordance with the 2018 action plan, the Pre-Season Environmental Compliance Assessment (PSECA) took place on March 4–22, 2017, at 47 sites in the four districts of Mopti, Bandiagara, Bankass and Djenné. The PSECA was carried out by an inspection team led by the VL Mali ECO with

representatives of the MOE's national, regional, and local service. The ODK application was used to complete Environmental Assessments. The objectives of this inspection were to:

- Perform the initial and final PSECAs using the ODK application through a smartphone to assess the condition of all operational sites. Data collected from the smartphone were uploaded to the Abt Associates environmental compliance database generating worklist for action to be taken or giving Greenlight about the readiness of the operational site
- Review the location and physical condition of insecticide storerooms;
- Identify sites for fixed or mobile soak pits;
- Check the availability of sufficient quantities of PPE and hygiene items;
- Identify problems related to the storage of insecticides and equipment;
- Check the availability of pesticide-specific antidote at the district health center; and use the worklist generated by the ODK application and, in complement, the trip report containing the recommendations to elaborate a rehabilitation plan. The initial PSECA provided a list of findings, including operational site-specific strengths and weaknesses.

VL Mali resolved all gaps identified during the initial PSECAs and all facilities were brought into compliance before the campaign started. The final PSECA, completed several days before the scheduled start of the campaign, verified the completion of all rehabilitation activities and the confirmed the readiness of each operational site. A summary of repairs is listed in Table 10 and responses to site-specific recommendations are listed in Annex G.

TABLE 10: REFURBISHMENTS AT IRS OPERATION SITES, BY DISTRICT

District	Number of operations sites	Site Refurbished (soak pit, storeroom, fence, etc.)
Mopti	16	<ul style="list-style-type: none"> • 20 soak pit refurbished and all are in new design. • 16 offices and storage facility are provided • A warehouse rented
Bandiagara	19	<ul style="list-style-type: none"> • 11 soak pit refurbished and all are in news design. • 5 new soak pits constructed in new design • 8 MSP • 19 offices and storage facility are provided
Djenné	7	<ul style="list-style-type: none"> • 6 soak pit refurbished and all are in news design. • 2 new soak pits constructed in new design • 1 MSP • 7 offices and storage facility are provided
Bankass	5	<ul style="list-style-type: none"> • 6 soak pit refurbished and all are in news design. • 3 MSP • 5 offices and storage facility and a warehouse are provided

6.5 MID-SPRAY INSPECTION

To be more vigilant regarding safety and environmental compliance issues, two teams of 10 inspectors (ECO, and nine representatives from the MOE) performed inspections throughout the 2018 campaign.

Representatives of environmental services at the national, regional, and district levels were involved with the environmental inspections. The main practices the inspections sought to enforce were: no eating during IRS operations; keeping poultry and other livestock, children, and pets away during spraying; doing secure transport of operators and insecticides; triple-rinsing, checking, and collecting empty insecticide bottles/sachets; having full first aid and spill management kits at stores; carrying out the washing process at the end of the day; keeping teams supplied with soap and water (for cleaning); and properly managing sweeping by homeowners after structures were sprayed.

It is important to note that each inspection team had a smartphone for filling checklists and sending them to the server in Rockville; the feedback from the server was sent to the COP, operations manager, M&E manager, and ECO for corrective measures to be taken.

All of these compliance issues were resolved in collaboration with the operations manager and the coordinators.

6.6 WASTE MANAGEMENT PLAN

At the end of campaign, all waste was collected and transported to the central warehouses in Bankass and Mopti. All empty Actellic 300CS bottles will be rigorously washed with detergent and pierced at the bottom before given to the partner, Unité Malienne des Plastiques (UMAPLAST). From the warehouse, bottles and others plastic waste will be transported to the UMAPLAST site in Bamako. At the time this report was written, the empty bottles had been transported to the central warehouses.

Incineration is scheduled to start in the middle of November 2018.

Other wastes, such as empty sachets of SumiShield, contaminated masks, and cardboard, will be incinerated by trained operators at the VL Mali incinerator at the Noumoubougou landfill. Details on disposal plans are shown in Table 11.

TABLE 11: 2018 WASTE QUANTIFICATION CHART

Waste Type	Amount of Waste	Disposal Method	Disposal Site	Date of Disposal
Empty Actellic bottles Actellic300CS	42,412	Recycling	UMAPLAST	December 2018
Empty sachets SumiShield	34,573	Incineration	Noumoubougou/Koulikoro	December 2018
Non-defective Contaminated Cardboard	4,112	Incineration	Mopti Regional Discharge	December 2018
Dust mask	22,960	Incineration	Noumoubougou/Koulikoro	December 2018

6.7 COMMUNICATION FOR EFFICIENCY

Introduced in the past campaign, the focus has been on communication between the team leaders and SOPs. Each SOP is assigned to spray a certain number of structures per day, according to the locality. Prior to mixing a unit of insecticide toward the end of the day, an SOP communicates with the team leader, who checks with other SOPs to learn if any has finished spraying his/her assigned structures and has pesticide remaining in the pump. The SOP who needs additional pesticide to finish spraying takes the remaining quantity from their colleague's pump. This helped VL Mali to limit its production of wastewater and to avoid wasting insecticide.

This system worked so well this year that the operators of some health areas almost no longer used the barrel reserved for the remaining insecticide in pumps at the triple rinse of the end of the day cleanup as they returned from the field with empty pumps. This technique can be tried in other countries.

6.8 INCIDENTS

VL Mali recorded one vehicle incident during the 2018 IRS campaign (Table 12).

TABLE 12: INCIDENTS REPORTED DURING THE 2018 CAMPAIGN

Date	Description of Incident	District
08/28/2018	Two members of the VectorLink entomology team were in a vehicle accident caused by the driver avoiding another collision on the road. No one was injured.	Mopti

7. ENTOMOLOGY

7.1 INTRODUCTION

The 2018 IRS campaign used SumiShield 50WG in Djenné and Mopti and Actellic 300CS in Bandiagara and Bankass. Quality assurance testing was performed in all targeted districts (Table 13) 1–2 days after IRS using cone bioassays on sprayed walls. The bioassays were carried out with a laboratory-reared susceptible colony of *An. coluzzii* following WHO protocols.

Cone bioassays were conducted in a total of 24 structures (seven in Djenné, seven in Mopti, five in Bandiagara and 5 in Bankass). Four types of wall (mud, painted mud, cement, and painted cement) have been tested. The number of each type of wall tested in each district is mentioned in Table 14. In each sprayed house, laboratory susceptible *Anopheles* mosquitoes were exposed on a wall at varying heights, 0.5 m, 1.0 m, and 1.5 m from the floor. Negative controls were performed in parallel with mosquitoes exposed to untreated blocks that were tested in an unsprayed area. The contribution of airborne effects to overall mortality in cone bioassays was also assessed using fumigant bioassays. Thus, 10–12 females *An. coluzzii* susceptible strain were introduced into a cage set on a chair, approximately 10 cm away from the sprayed wall and about 1.0 m above the floor. For all testing, exposure time was 30 mins, and subsequent mortality was recorded 24 hours later.

TABLE 13: IRS CONE BIOASSAY SURVEILLANCE SITES FOR 2018

District	Health Area	Site (village)	Spray Status	Insecticide Sprayed*	Geographic Zone	IRS History
Mopti	Sokoura	Sarema	Sprayed	Sumishield 50WG	Sahelian	2017 first year of OP IRS
Bandiagara	Bandiagara Central	Bendjeli	Sprayed	Actellic 300 CS		2017 first year of OP IRS
Bankass	Bankass Central	Bankass	Sprayed	Actellic 300 CS		2017 first year of OP IRS
Djenné	Madiama	Madiama	Sprayed	Sumishield 50WG	Sahelian Flooded	2017 first year of OP IRS

* The insecticide listed here is the primary insecticide sprayed. In the first five days, Actellic 300CS was used exclusively in all 10 urban health areas to ensure the exhaustion of imminently expiring inventory in the event the campaign would be interrupted due to security conditions. The insecticide listed in Table 13 was used thereafter.

TABLE 14: NUMBER OF EACH TYPE OF WALL TESTED IN EACH SITE

Districts	Site (village)	Mud (N)	Painted mud (N)	Cement (N)	Painted Cement (N)
Mopti	Sarema	3	2	2	0
Bandiagara	Dandoly	4	0	1	0
Bankass	Bankass	2	2	0	1
Djenné	Madiama	4	2	0	1
Total		13	6	3	2

7.2 RESULTS

Following the WHO cone bioassays conducted 1-2 days after spraying, mortality rates of 100 percent were recorded after a 24 hour holding period, regardless of the type of sprayed insecticide (Actellic 300CS or SumiShield 50WG) and the type of wall (of mud, painted mud, cement, and painted cement) though not all wall types were found in all districts (Figure 6). The control mortality rates were 0 percent for Actellic 300CS and ranged from 0 percent to 5.6 percent for SumiShield 50WG.

A substantial fumigant effect was also observed for both sprayed insecticides. Indeed, mortality rates due to the air-borne effect of Actellic 300CS varied from 43.5 percent to 100 percent (Figure 7) compared to 0 percent in the controls. SumiShield 50WG also displayed an airborne effect, with mortality rates ranging from 50 percent to 100 percent (Figure 7) as compared to control mortality rates of 0 percent to 8.3 percent.

FIGURE 6: RESULTS OF QUALITY ASSURANCE CONE BIOASSAY TESTING FOLLOWING IRS (SEPTEMBER 2018)

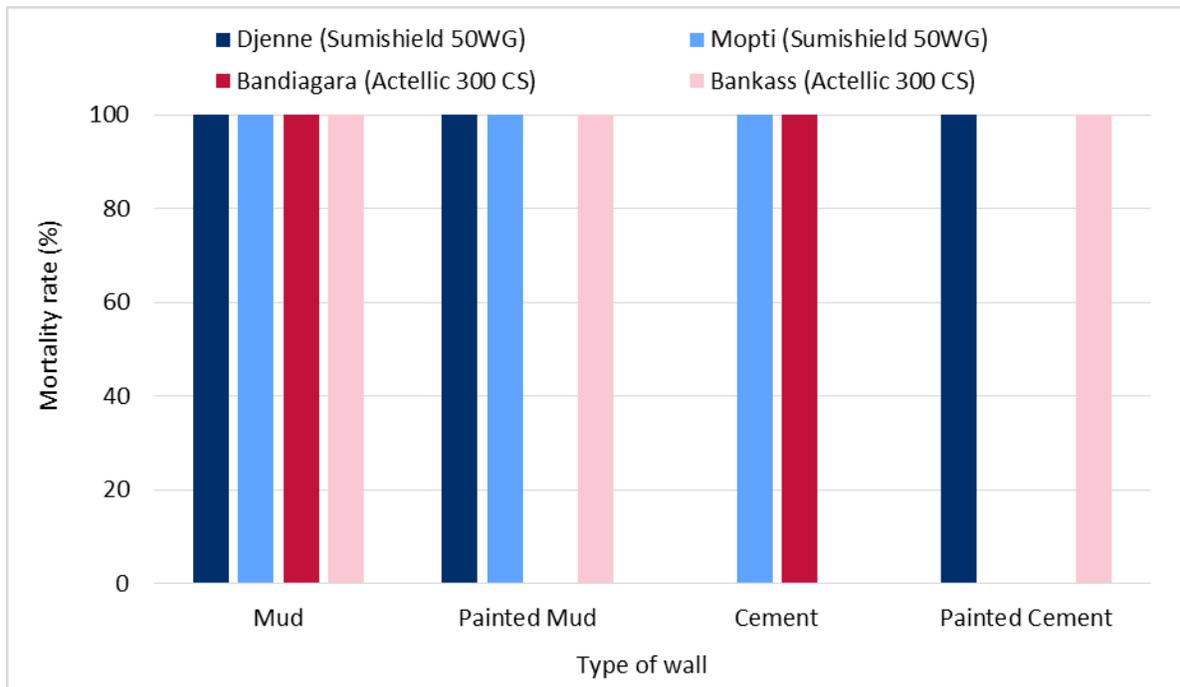
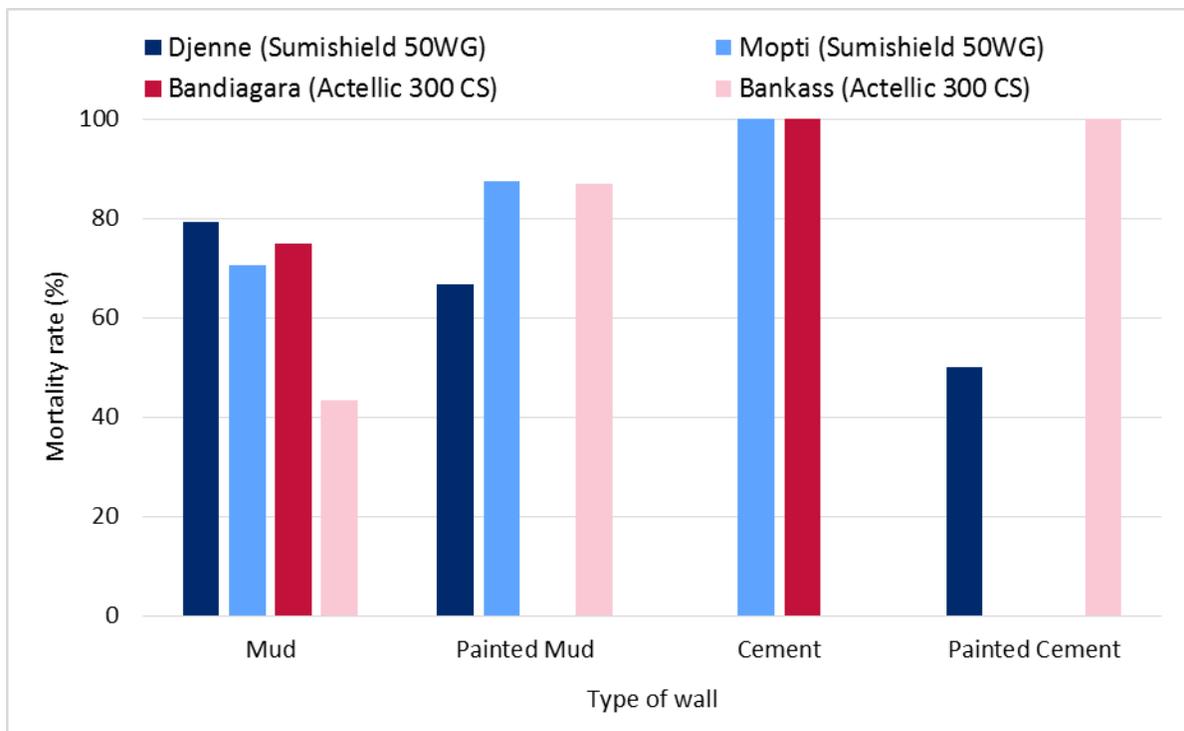


FIGURE 7: RESULTS OF FUMIGANT BIOASSAYS



8. POST-SPRAY ACTIVITIES

The 2018 IRS campaign was interrupted on October 2, 2018, due to a stock-out. This chapter discusses activities implemented after the campaign was completed.

8.1 POST-SPRAY MEETINGS

From November 1 to 7, 2018 VL Mali staff held a review meeting in each of the four spray districts. DTCs, ASACO leaders, village chiefs, and representatives from community women's and youth associations, local NGOs, and mayors and prefects attended the meetings. Seasonal IRS campaign staff including SOPs, team leaders, district coordinators, and storekeepers also attended. The meetings enable community members to jointly assess the 2018 spray campaign and provide recommendations for improving IRS programming in 2019.

8.2 POST-SPRAY INVENTORY

Starting in October, the project team returned all PPE, insecticide and other consumables left over from the 2018 IRS campaign to the two central warehouses, where the VL Mali Logistics and Procurement Coordinator and Warehouse Managers inventoried them. The results of the inventory are included in Annex A.

8.3 POST-SPRAY CAMPAIGN RADIO PROGRAMS

Two weeks after the end of the IRS campaign, 12 radio broadcasts in the four districts offered short messages and programs that reinforced information on the following topics:

- The advantages and importance of sleeping in sprayed structures, to prevent malaria transmission;
- The importance of continuing to use insecticide-treated bed nets even after the spraying;
- Sprayed walls should not be painted or plastered until March, to allow the insecticide to remain effective against mosquitoes; and
- General information on malaria transmission, prevention, and treatment.

9. CAPACITY-BUILDING ACTIVITIES

IRS is one of several proven effective malaria vector control interventions, and vector control is one of many approaches in the broader fight against malaria in Mali. In an effort to promote government ownership and sustainability of integrated vector control strategies in Mali, the VL Mali team is committed to a building government capacity to plan, implement, monitor / supervise, and report on IRS.

Similarly to past years, the IRS campaign was planned and conducted hand in hand with regional, district, and health area-level MOH personnel. The number of MOH personnel serving as supervisors in the 2018 campaign increased from four in 2017 to nine in 2018. In addition to fulfilling the capacity building mandate, the VL team is dedicated to ensuring these individuals are highly skilled in IRS management not only because they depend heavily on the MOH personnel to conduct high quality supervision in areas where they were advised not to travel.

At the national level, the number of participants in IRS activities increased from two (one focal point from NMCP and one from DNACPN) to six (three from each agency). For each planning activity, a working session was organized to develop and assign a list of tasks among partners. The government partners contributed significantly as:

- Participants in the insecticide quantification workshop
- Facilitators in microplanning workshops, TOT, training of entomological technicians, and post-campaign restitution meetings;
- Hosts of radio program for community mobilization before and during the campaign;
- Supervisors during the training of mobilizers, operators, team leaders, supervisors, storekeepers, washers, and security guards,
- Supervisors during the campaign and entomological monitoring activities (residual life and resistance);
- Inspectors during pre-, mid-, and post-campaign environmental compliance assessments;

Over time, the objective of the VL project is to equip the NMCP and DNACPN with the skills and institutional knowledge to carry out IRS activities independently from VL while maintaining PMI standards (perhaps in another region in Mali, with progressively decreasing support every year). At the close of the 2018 IRS campaign, the VL Mali team esteems that NMCP and DNACPN have gained the following capacities:

DNACPN:

- Conduct pre-, mid-, and post-IRS environmental compliance inspections using smartphones and
- Lead the environmental compliance component of TOT.

NMCP:

- Coordinate and facilitate IRS microplanning activities;
- Quantify the insecticide and other material needs for an IRS campaign; and
- Lead spray techniques, data collection, and entomological monitoring components of TOT.

10. GENDER

In 2018, the project intensified the recruitment of women to serve as seasonal staff. As mentioned

earlier in the report, VL Mali organized orientation meetings to introduce IRS at all levels (region, health district, health area, and villages). At the meetings, VL Mali highlighted the importance of engaging more women in IRS implementation. The burden of malaria is essentially on women in Mali because local gender norms that assign women the role of caring for ill family members, which is why women's involvement in IRS activities is strongly encouraged. These activities are a very useful source of income, making women's employment in IRS a driver of women's economic empowerment in the districts where VL Mali operates.

FIGURE 8: LEFT TO RIGHT, OUR GENDER FOCAL POINT, COMMUNAITY SUPERVISOR, AND TEAM LEADER



In addition, women play a very important role in the success of community health activities by facilitating mobilization and awareness.

The project team clarified what measures it takes to make sure the workspace for female staff was comfortable and requested support of the leaders in involving more females in the spray campaign, including the separation of wash facilities and improved privacy in the women's facilities. The leaders of the selection committee agreed, and with their support, the project was able to increase the number of qualified women hired as seasonal workers.

The project worked with the Coordination of the Women's Associations and NGOs (CAFO) of all districts for awareness during the IRS campaign.

During the 2018 spray campaign in Mopti, 21.7 percent of people trained were female vs 15.9percent in 2017. The breakdown is shown in Table 15.

TABLE 15:STAFF TRAINED, BY GENDER, 2017 VS 2018

Categories of Persons Trained	2017				2018			
	Male	Female	Total	Percent Female	Male	Female	Total	Percent Female
DTC	45	8	53	15%	39	7	46	15%
District Coordinators	4	0	4	0%	4	0	4	0%
Spray operators	659	101	760	13%	547	79	626	13%
Data clerks	5	19	24	79%	2	14	16	88%
Community Supervisors	47	6	53	11%	47	8	55	15%
Team leaders	150	22	172	13%	125	18	143	13%
Washers	0	113	113	100%	0	115	115	100%
Logisticians	4	0	4	0%	4	0	4	0%
Secondary warehouse keepers	39	14	53	26%	35	11	46	24%
Central warehouse keepers	2	0	2	0%	2	0	2	0%

Categories of Persons Trained	2017				2018			
	Male	Female	Total	Percent Female	Male	Female	Total	Percent Female
Doctors involved in treating cases of poisoning	45	8	53	15%	39	7	46	15%
Mobilizers	1265	189	1,454	13%	1,054	318	1372	23%
Entomology technicians	13	2	15	13%	12	3	15	20%
Security guards	102	2	104	2%	85	5	90	6%
Drivers (moto, minibus, pick-up)	167	0	167	0%	110	0	110	0%
Radio hosts	12	0	12	0%	12	0	12	0%
TOTAL	2,559	484	3,043	15.9%	2,117	585	2,702	21.7%

Compared to 2017, the number of women in the teams increased as a result of some of the project's actions:

- Emphasized selection committees to focus on the recruitment of qualified women;
- During the community meetings, emphasized the importance of women's involvement in the IRS and
- Entrusted women with posts (for example, IRS data transporter, security guard, and a pump technician in Djenné) that were typically occupied by men.

Encouraging results have been achieved through women's leadership in some health areas. Some women who exceeded expectations this year during the campaign include:

- Technical Directors of Community Health Centers in Socoura and Medina (Mopti) and Senossa (Djenné);
- Supervisors of Konna and Sevare (Mopti) and Bendiely (Bandiagara);
- Pump mechanic and data transporter in Djenné; and
- Storekeepers from Toguel and Socoura in Mopti (district).

II. LESSONS LEARNED AND RECOMMENDATIONS

The 2018 IRS campaign was met with considerable challenges, namely an unprecedented security situation in the target area. In addition, the combination of an unanticipated increase in acceptance of IRS and misconceptions about the effectiveness of insecticide with mild odor led to more rooms being sprayed per structure in 2018 than in 2017 and also to beneficiaries pushing the SOPs to double spray their structures, which resulted in a stock-out of insecticide. In spite of these major setbacks, the VL Mali team successfully and safely protected 665,581 people from malaria through the application of long-lasting insecticides to the interior walls of residential structures. The challenges faced were considered a learning opportunity for continual improvement of IRS operations in Mali.

Lessons learned in the 2018 IRS campaign and recommendations for future campaigns include:

Security:

- Insecurity presents a considerable operational hurdle, particularly in terms of managing transportation of personnel and commodities.
- In unstable security conditions, ensure that the actors on the ground are empowered to avoid areas that they suspect are unsafe.
- Maintain and support a constant and clear chain of communication during the IRS campaign. Any security information must be transmitted immediately from an actor to his or her supervisor and vice versa to reduce the risk of exposure.
- Hire a seasonal employee to oversee security during the IRS campaign. In previous campaigns, the COP and Operations Manager spent a lot of time on security issues. Recruiting a security officer during the IRS campaign will allow them to focus on other aspects of the campaign and streamline the flow of security information.

Planning:

- The insecticide stock out prevented the achievement of campaign objectives. In the future, insecticide should be quantified by health area rather than by district, based on historical consumption data and taking relevant contextual factors (and any evidence of double-spraying in 2018) into consideration.
- The houses in certain neighborhoods of the towns of Mopti and Djenné are built in a unique style that leaves no space in the courtyard (Figure 9). The rooms inside are filled with goods and furniture that are difficult to remove and store safely during spraying.

FIGURE 9: EXAMPLES OF RESIDENTIAL COURTYARDS IN URBAN MOPTI AND DJENNÉ



Training, roles, and responsibilities:

- Enhance training of spray operators, team leaders, supervisors, and other actors on adherence to best practices in spray procedures and data collection. More precisely, the training will explain how the correct dose is determined, and emphasize the importance of adherence to the BMP standards to ensure safety of the beneficiaries:
 - 7.5L for the total mixture volume per unit of insecticide,
 - the width of a single swath to be sprayed (75cm wide with a 5cm overlap),
 - the distance between the wall and the nozzle (45cm), and
 - spraying speed (2.5 seconds / linear meter).
- Keep supervisors accountable for monitoring campaign progress, including insecticide consumption, on a daily basis throughout the campaign. Empower warehouse managers and storekeepers to analyze the insecticide consumption relative to the number of structures sprayed and raise unusual activity to leadership. Each site will be equipped with a formal register to document daily reconciliation meetings to ensure all site leadership and storekeepers are coordinated and the campaign is progressing at the expected pace.
- Frequent communication between SOPs and team leaders made it possible to use insecticide efficiently and minimize leftover insecticide at the end of the day.

Mobilization:

- Consider using a megaphone to inform the community about the arrival of SOPs; this strategy produced good results in Socoura health area.
- The use of other communication strategies such as the involvement of town criers and places of worship greatly strengthens the mobilization.

- The involvement of local authorities greatly contributes to the management of refusal cases.
- Dispel misperceptions about insecticide efficacy that resulted in beneficiaries pressuring SOPs to apply excessive insecticide. In future years, IRS TOT and the radio programs will be reinforced with the involvement of the VL Mali Entomology team to provide explanations of the types of insecticides used, their residual life, their effectiveness, and their smell. During the training of the SOPs, the emphasis will be on proper mixing and application, accountability for appropriate consumption rates, and equipping them to manage pressure from the community through sensitization on the odor and the effectiveness of the insecticide.

Logistics:

- The phased start of the campaign, due to the security situation and presidential elections, made it difficult to implement activities, and provide adequate supervision to ensure high spray quality and data quality.
- The late start of the campaign due to insecurity surrounding the presidential election resulted in implementation during a period of heavy rain, which made it difficult to access certain villages.
- Selecting local providers for campaign vehicles/taxini increased the acceptance of IRS in the project area. The use of the horse cart has circumvented the banning of motorcycle traffic and ensured spraying in some villages in Bandiagara District.
- Consider the structures in concessions where there is no space in the yard to be ineligible as well as large apartment complexes in the urban centers of Mopti and Djenné.
- Increase the number of women in the criteria for selecting actors (for all positions) for the campaign.

Monitoring and Evaluation:

- Migrate data collection to the DHIS2 system to give Abt Home Office real-time access Mali campaign information. Revisit the utility of existing monitoring tools (PMT, etc.) in the Malian context, especially with the introduction of DHIS2.
- Optimize the transport of SOP data collection forms so that the delay in primary data collection and data entry is minimized, and unusual trends can be detected sooner.
- Operationalize the review and discussion of supervision forms at least every two days, if not more frequently, to detect any deviation from best practices and/or discuss unusual trends detected.
- Include warehouse Managers in the chain of transmission of information on the spray progress by health area.
- In addition to a report at the end of each activity, the project will provide to technical partners with supervision tools by determining a number of times that they must apply them.

ANNEX A: 2018 POST-IRS INVENTORY

TABLE A-1: WAREHOUSE INVENTORY

Item Description	Balance after 2017 IRS Campaign	Number of Items Procured in 2018	Stock Before 2018 IRS Campaign	Consumed/ Unusable Stock after 2018 IRS Campaign	Usable Stock Remaining for 2019
International Procurement					
Insecticide, Actellic 300CS / Exp Mrch 19	42412		42412	42412	
Insecticide, Sumshield 50WG /Exp Feb 2021	0	34573	34573	34573	0
Spray Pump Goizper	874	175	1049	63	986
Helmet	1267	0	1267	406	861
Head Lamp	1298	149	1487	167	1320
Gumboots	1511	0	1511	2	15019
Coverall	2577	0	2577	3	2574
Tyvek Coverall /Mobile Soak pit Teams	1616	12	1628	0	1628
Wipes /"lingette"	7653	0	7653	0	7653
Thermometer, Simple /or Electronic	81	0	81	4	77
Gloves	1898	936	2834	1477	1357
Respirator Mask	5740	34440	40180	22960	17220
Face Shield	951	910	1861	1370	491
Support Face Shield	2659	0	2659	288	2371
Complete Handle /Goizper	196	40	236	116	220
Hose /Goizper	165	0	165	21	144
HandleGoizper	8	20	28	27	1
Team leader survey kit 7.5 /Goizper	565	100	665	337	328
Pressure regulator /Goizper	381	215	596	410	186
Fan even nozzle /Goizper	521	300	821	576	245
Filter simple /Goizper	312	150	462	386	76
Safety valve 2.5 bar /Goizper	408	150	558	67	491
Assembly (583,1175,19) /Goizper	221	150	369	190	179
Filter with gaskets /Goizper	383	400	783	195	588
Lance tube /Goizper	269	90	359	60	299
DISC HC 80 0.2 /3/Goizper	398	400	798	461	337
Valve /Goizper	36	422	458	236	222
Collar seal /Goizper	433	450	883	363	520
Wrench /Goizper pump	2	15	17	0	17
Trigger valve&Filter Assembly	15	10	25	23	02
Completed lid (couvercle Ref 1486)	07	00	07	00	07
Activated Carbon /Kg	60	70	130	27	103

Item Description	Balance after 2017 IRS Campaign	Number of Items Procured in 2018	Stock Before 2018 IRS Campaign	Consumed/ Unusable Stock after 2018 IRS Campaign	Usable Stock Remaining for 2019
Fisrt Aid Kit	130	198	328	219	109
Local Procurement					
Steel Container /forWaste	3	0	3	0	3
Motorbike /YBR125	15	0	15	0	15
Solar Mobile Lamp	57	16	73	0	73
Mobile Soak Pit	58	0	58	45	13
Bucket Plastic 60/ 40/30 Liters	427	0	427	1	426
Bucket Metal 10/15 liters	288	0	288	5	283
Waste Bin Hard plastic	103	0	103	0	103
Cup /metal /plastic 1 Liter	888	0	888	131	757
Scoreboard	40	25	65	0	65
Shovel with Short Handle					
Fire Extinguisher	83	0	83	0	83
Operator Bag	819	100	919	97	822
Monitor Bag	21	20	41	4	37
Tent for Mobile Sites	115	0	115	5	110
Life Jacket	15	0	15	0	15
Tarpaulin Simple	264	41	305	5	300
Tarpaulin for Mobile Soak Pit Floor	8	10	18	0	18
Raincoat	1011	60	1131	323	808
Red Bright Vest	122	0	122	3	119
Green Bright Vest	249	0	249	08	241
Lamp Guard	171	53	224	94	130
Water Filter	609	0	609	0	609
Plastic Drum/160/200 Liters	706	0	706	5	701
Bar Angle	472	0	472	333	139
Fence	104	0	104	34	70
IEC and Best Practices Tools ,IRS Cards					
T-shirts with Logo	0	2250	2250	1700	550
Hat with Logo	0	2250	2250	1700	550
IRS Card	37410	90684	128094	75686	95758
IRS Leaflet	113401	77968	191369	139651	51718
Metal sign "not allowed drink eat smoke"	89	0	89	0	89
Metal danger sign "Skull"	15	0	96	0	96
Sticker "not allowed drink eat smoke"	129	300	429	109	320
Danger Sticker "Skull"	166	300	466	89	377
Booklet Stores Good Practices	0	55	55	43	12
Procedures for Insecticide Transportation	324	100	424	24	400
Procedures for Insecticide Storage	452	100	552	0	552
Booklet on Structure Definition	1176	513	1689	178	1511

ANNEX B: IRS CAMPAIGN VEHICLE USAGE

TABLE B-1 : VEHICLE USAGE, BY DISTRICT, IN 2018

Operational Site	Number of Teams (SOP-TL-Sup)	Minibus (12-18 Seats)	Hard-top 4x4	Horse Carts	Pinnacle
MOPTI	48	14	5	36	0
DJENNE	15	8	3	6	7
BANDIAGARA	61	17	16	10	0
BANKASS	17	5	6	2	0
GRAND TOTAL	141	44	30	54	7

ANNEX C: DESCRIPTION OF 2018 TRAININGS

TABLE C 1: TYPE OF TRAINING

Type of Training	From	To	No. of Trainings	Description
Training of Trainers for Spray Campaign Operations	June 21	June 25	1	This was a refresher course for most of the district coordinators and for most of the DTCs.
Spray Operators	July 4 August 28	July 6 August 29	21 training sites (Bandiagara =7; Bankass=3; Djenné=4; Mopti=7)	The training covered spray techniques and rinsing of spray pumps, scheduling, and the methods for completing the 2018 IRS campaign with Malian government staff, and the correct ways for working with households before, during, and after spraying. 626 people participated in the training. Spray simulation concluded the last training day.
Supervisors and Team Leaders	June 30	July 2	1, all districts	The session was led by the VL Mali team and focused on supervision tasks, strategies, and the responsibilities and tasks of the supervisors and team leaders.
Logistics	June 30	July 2	1, all districts	Secondary warehouse managers were trained on how to manage the stocks of materials and equipment at their disposal.
Washers	August 29	August 29	4 (one per district)	Washers were trained on best practices of washing and rinsing.
Store Security Guards	August 29	August 29	4 (one per district)	Guards were trained on their roles and responsibilities in monitoring stores.
Radio Hosts	May 23	May 28	2 (one per two districts)	Hosts of community radio stations were trained on the IEC messages to disseminate and on how to fill out the monitoring cards of broadcast messages.
IEC Training of Trainers	May 23	May 28	2 (one per two districts)	The trainings covered key messages for the IEC mobilizers to communicate before, during, and after the IRS campaign to prepare households for the IRS campaign, provide information on malaria prevention, and answer questions. The DTCs participated in many of these trainings, and were available to speak about the malaria outreach programming that the health centers provide.

Type of Training	From	To	No. of Trainings	Description
IEC Training	May 31	June 1	47 (one two-day training at each site)	The training covered: <ul style="list-style-type: none"> • General information about malaria transmission, treatment, and prevention; • Schedule and details of IRS campaign activities; • Best practices and strategies for informing household members about the IRS campaign.
District Training Teams	August 29	August 29	1	Teams composed of 4 local coordinators, 4 logistics managers, and 2 central warehouse managers were oriented on their mission, tasks, and responsibilities.
Data Clerks	July 4	July 6	1	Data clerks were familiarized with the IRS campaign data entry forms and the database used for uploading all IRS campaign data. The clerks also practiced entering data.
Security Transportation Drivers	August 25 September 2	August 25 September 2	1, all districts	In the 7 health areas of Mopti ville, the health areas of Central Djenné, Central Bandiagara, and Central Bankass the training was held August 25 while the others received the training on September 2. Drivers hired to transport IRS commodities and spray teams learned correct methods to secure and safely handle insecticides. Participants learned how to manage an insecticide spill and safely clean vehicles after each day of the IRS campaign. Emphasis was placed on raising awareness of the use of safety belts by all passengers and strict compliance with other traffic rules.
Medical Staff who Manage Insecticide Intoxication Cases	May 25	May 26	2 (one per two districts)	The training reviewed the correct protocol and methods for treating any SOP who was injured or fell sick from his/her activities in the IRS campaign. The DTCs were asked to present this information to the district health staff.
Entomology Technicians	May 28	May 30	1	Entomological technicians were trained in mosquito field collection practices, insectary maintenance, identification of mosquito breeding sites, larval and pupae collection, identification of <i>Anopheles</i> larvae from Culiciene, and managing Human Landing Catches.

ANNEX D: CORRESPONDENCES FOR THE EXCLUSION SOME VILLAGES

FIGURE D-1: CORRESPONDENCE FROM SAMPARA AND DIAMBACOUROU HEALTH AREAS IN MOPTI DISTRICT

Rapport de situation
Sécuritaire

Suite à des informations relatives à la circulation des hommes armés dans certaines localités de l'aire de santé de Sampara, nous agents de santé du C.S.com de Sampara assurant la Pulvérisation Intra-domiciliaire (PID) avons jugé nécessaire d'élucider les villages et hameaux dont les noms suivent de la campagne de 2018 pour des raisons de sécurité :

- Beri,
- Tepaxal,
- Ségué bougué,
- Tomborguel,
- Ouro-Néma,
- Ouro-Melbel,
- Dejou,
- Dequena,
- Sars-Hamadé.

Le DTC
Dr. Dramane Doumbia

07/10/18

Région de Mopti
Cercle de Mopti
FELHSCOM Mopti
ASACO DIAMBACOUROU

Aire de Santé
Diambacourou

P.V. de Réunion

- Les Conseillers des sages s'est réunis ce jour 31 Août 2018 au domicile du chef de village, sous la présidence du chef de village par intérim Sékou A. Timbo.

- Etaient présents, les sages dont les noms suivent :

- 1- Sékou A. Timbo chef de village
- 2- Kalou Timbo Titulaire ASACO
- 3- Soumaila Diallo Titulaire Administratif ASACO
- 4- Kalifa Timbo " " adjoint
- 5- Aly Timbo Coisant ASACO
- 6- Sory Timbo Supérieur PID
- 7- Fistonata Soumane Présidente des Femmes
- 8- Mame Djou Timbo 1^{er} adj. au Maire
- 9- Mame Péro Timbo 2^e adj. au Maire
- 10- Malado Landoué Conseiller

- Les sages décident compte tenu de la situation sécuritaire post électorale présente, il n'est pas prudent de procéder aux activités de la PID.

- Les sages prient le report des activités PID de cette année dans l'aire de Santé Diambacourou.

1^{er} Adjoint au Maire Président ASACO

le chef de village

P/I

FIGURE D-2: CORRESPONDENCE FROM IBY HEALTH AREA IN BANDIAGARA DISTRICT AND BANKASS DISTRICT

À Monsieur le Chef des services des données du projet
PMI Vectorlink Mali; TOI

Monsieur le Chef de service, je viens par cette note auprès de vous pour vous donner la situation des villages dont les concessions ont été brûlées inhabitables dont les structures qui ne seront pas retrouvées probées sont :

Au niveau de Nani Ogrou le quartier Bourouque les concessions concernées sont les concessions du numéro 0007 jusqu'au numéro 0019

Et au niveau de Abg damalo le quartier Grogondou du numéro des concessions des numéros 0007 jusqu'au numéros 001

Ces populations de ces hameaux, une partie eux sont retournées dans les villages mieux une autre partie se retrouvent dans la commune de Madougou et d'autres sont parties en avanture.

Abg le 25 septembre 2018

Le DTC



République du Mali
Un Peuple-Un But-Une Foi

Region de Mopti
Cercle de Bankass
Centre de santé de référence

Dr Mahamadou GUINDO Médecin-Chef
District sanitaire de Bankass

Le Médecin-Chef du District sanitaire de Bankass
A
Monsieur le de Projet Vectorlink-Mali

Objet : Lettre d'information

Monsieur le Directeur,
J'ai l'honneur de vous confirmer que la campagne 2018 a été réalisée dans un climat d'insécurité au niveau du District sanitaire de Bankass, mais grâce à la volonté conjuguée de tous les acteurs nous sommes arrivés à un résultat satisfaisant. Cependant il faut signaler que la couverture n'a pas été effective dans certaines zones à cause de la situation d'insécurité du moment (Voir liste villages et hameaux en annexe).

Monsieur le Directeur malgré les difficultés nous sommes engagés à plus de couverture géographique pour la campagne 2019.

Veillez agréer, Monsieur le Directeur, l'expression de nos considérations les plus distinguées.

Bankass le 25 SEPTEMBRE 2018

LE MEDECIN CHEF
DR GUINDO MAHAMADOU



AIRES DE SANTE	VILLAGES	HAMEAUX	OBSERVATIONS
PISSA	Libé Habé	Nagadougou, Baradougou, Bourré, Libé koura	Les deux villages de Libé, en plus de leurs hameaux n'ont pas été pulvérisés y compris Saniétti (hameaux de Pissa). C'est une zone de tension par excellence. Elle est supposée abriter des hommes armés.
	Libé peuh Pissa	Bida Saniétti	
NIAMIAN	Niamian	Wosé, Ouro-Erne, Toué, Djoulahiri Capement Bella (Drougou) Campement peuh (Dian)	Ces hameaux de Niamian sont également considérés comme des zones dangereuses où évoluent les hommes armés.
Baye	Baye	Libé yara korossougou Lougoutourou Kamle fitini kamlabougou Moromara Doulinougou Baccourba Dabé Siy Namatoulaye Bamakocoura Néma Bissan I	Ces hameaux de Baye n'ont pas pu être pulvérisés à cause de l'insécurité dans la zone et la montée du niveau d'eau du « lac sourou » qui nécessite la traversée par pirogue.

ANNEX F: PMI VL MALI M&E PLAN INDICATOR MATRIX

Updated: November 13, 2018

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results										
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5		
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result	
Objective I: Implementation of Malaria Vector Control (VC) Interventions														
I.1 Successfully execute IRS and other malaria vector control programs														
I.1.1	Annual country work plan developed and submitted on-time	Project records Annually		1; 100%	1; 100%									
I.1.2	Number of eligible structures targeted for spraying	Project records Annually		205,612 ⁵	167,598									
I.1.3	Number of eligible structures sprayed with IRS	Project records Annually		183,225	160,723									
I.1.4	Percentage of total structures targeted for spraying that were sprayed with a residual insecticide (Spray Coverage)	Project records Annually		85.0%	95.9%									
I.1.5	Number of people protected by IRS	Project records Annually	Male Female Pregnant women Children <5	772,376	665,581 338,291 327,290 20,992 93,968									
I.1.6	EOSR submitted within 45 days after the end of spray (including completing MEP and EMMR) ⁶	Project Annually		1; 100%	Completed									

⁴The only VC intervention that VectorLink Mali will be undertaking in year one is IRS. As such all targets and results in year one are only relevant to IRS programming.

⁵The original target in the workplan was 215,558 structures. After one health area, twelve villages and one hamlet in Mopti, two villages and thirteen hamlets in Bankass, two hamlets in Bandiagara and free villages in Djenne, were excluded due to security concerns, the IRS campaign target was further adjusted to 205,612 structures.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.1.7	Post-spray Data Quality Audit conducted within 90 days of spray completion ⁷	Data Collection Forms Annually		1; 100%	In progress								
1.1.8	Number of Insecticide Treated Nets (ITNs) distributed, by channel	Project Records Annually	Channel	N/A	N/A								
1.1.9	Conducted at least one process assessment of the quality of ITN distribution planning, the quality of household registration, and/or ITN distribution implementation during a mass ITN distribution campaign	Project Records Annually	Channel	N/A	N/A								
1.1.10	Operational routine monitoring systems for continuous ITN distribution established and disaggregated by channel	Project Records Annually	Channel	N/A	N/A								
1.1.11	ITN durability monitoring data collection completed on time as planned in a given project year	Project Records Annually		N/A	N/A								
1.2	Provide technical assistance and planning support for IRS and other integrated malaria vector control activities												
1.2.1	Number of VC project training workshops targeting NMCP and other host country staff	Project Training Records ⁸ Annually	Technical Area Job Function	1	1 ⁹								
1.2.2	Number of NMCP and other vector control host country staff accessing DHIS2	DHIS2 Logs Annually	Job Function	N/A	N/A								
1.3	Ensure safe and judicious use of insecticides and other malaria vector control products												
1.3.1	Number of vector control personnel trained in environmental compliance and personal safety standards in vector control implementation	Project Training Records Annually	Sex (# and %) Male Female Job Function	1,043 ¹⁰	1,020 ¹¹ 792; 77.6% 228; 22.4%								

⁶Once approved by PMI, the Mali EOSR will be translated into French and shared with NMCP for dissemination

⁷The NMCP will participate in conducting the Post-Spray Data Quality Assessment (PSDQA). Once approved by PMI, the Mali PSDQA report will be translated into French and shared with NMCP for dissemination. As noted in the 2018 Work Plan, conducting the Mali PSDQA is contingent on the security situation.

⁸Project training records will be maintained by VectorLink Mali and shared with NMCP/MOH counterparts. This applies to all subsequent references to project training records in this MEP.

⁹NgenIRS Insecticide 2019 Forecasting and Validation Workshop, August 16th & 17th 2018 to be held in Cotonou, Benin. NMCP Entomologist and Sentinel site Officer.

¹⁰This indicator includes the following vector control personnel: spray operators (626), team leaders (143), washers (115), storekeepers (46), and guards (90).

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
I.3.2	Number of health workers receiving insecticide poisoning case management training	Project Training Records Annually	Sex (# and %) Male Female	47	46 39; 84.7% 7; 15.2%								
I.3.3	Number of adverse reactions to pesticide exposure documented	Incident Report Forms Annually	Type of Exposure	0	0								
I.4	Strengthen capacity of NMCPs, vector control personnel, and other institutions to implement and manage IRS and other vector control activities												
I.4.1	Total number of people trained to support VC in targeted areas	Project Training Records Annually	Sex (# and %) VC Intervention Type Government Affiliation Male Female	2,711 ¹²	824 ¹³ 719; 87.3% 105; 12.7%								
I.4.2	Number of people trained during IRS Training of Trainers	Project Training Records Annually	Sex (# and %) Government Affiliation Male Female	51 ¹⁴	50 ¹⁵ 43; 86% 7; 14%								
I.4.2 b	Number of government staff serving as trainers in IRS TOT ¹⁶	Project Training Records Annually	Sex (# and %) Male Female	12 ¹⁷	12 11; 91.7% 1; 8.3%								
I.4.3	Total number of people hired to support VC in target districts	Project Records Annually	Sex (# and %) Job Function Government Affiliation VC Intervention Type Male Female	2,368 ¹⁸	2,622 ¹⁹ 2,049; 78.1% 573;21.9%								

¹¹This indicator includes the following vector control personnel: spray operators, team leaders, washers, storekeepers, and guards.

¹²DTC (47), Coordinators (4), SOPs (641), Data clerks (29), Supervisors (56), Team leaders (146), Logisticians (4), Storekeepers (47), guards (92), Washers (117), Monitors (12), Pump Technicians (14), Drivers (134), Mobilizers (1,366) and Warehouse Managers (2).

¹³SOPs (626), Supervisors (55), Team leaders (143); none were previously affiliated with government posts

¹⁴DTC (47).

¹⁵DTC (46)

¹⁶Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

¹⁷NMCP (3), DNACPN (3), DRS (2), DRSEs (2), DRACPN (2)

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results											
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5			
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result		
I.4.4	Number of government/district officials who acted as supervisors during VC campaigns	Project Records Annually	VC Intervention Type	35 ²⁰	33 ²¹										
I.5 Promote gender equality in all facets of planning and implementation															
I.5.1	Number of women hired to support VC campaigns	Project Records Annually	Returning female seasonal workers hired in a more senior capacity Government Affiliation	TBD; 35%	573 ²²										
I.5.2	Number and percentage of women hired in supervisory roles in target areas for vector control activities	Project Records Annually	VC Intervention Type Job Function Government Affiliation	TBD; 50%	8 Community Supervisors ²³										
I.5.3	Number and percentage of staff (permanent and seasonal) who have completed gender awareness training	Project Training Records Annually	Sex Job Function Government Affiliation	2,727; 100%	2,671 2,091; 78.3% 580;21.7%										
I.5.4	Number and percentage of women in senior leadership roles in VectorLink country offices	Project Records Annually	Sex (# and %)	N/A	N/A										
I.6 Implement and support social behavioral change communication and mobilization activities															
I.6.1	Number of radio spots and talk shows aired	Project Records Annually	VC Intervention Type	7,560 ²⁴	7,560										
I.6.2	Number of print materials disseminated	Project Records Annually	VC Intervention Type	83,000	83,000										

¹⁸ This number excludes washers (117), drivers (134) and security guards (92).

¹⁹ This number excludes washers (115), drivers (110) and security guards (90). None of these actors were previously affiliated with government posts.

²⁰ NMCP (10), DNACPN (2), DRS (3), DRDSES (3), DRACPN (1), CSREF (8), SLDSES (4), SACPN (4).

²¹ NMCP (2), DNACPN (3), DRS (3), DRDSES (3), DRACPN (2), CSREF (12), SLDSES (4), SACPN (4).

²² None of the women hired were previously employed and hired to a more senior role, nor were any previously affiliated with government posts.

²³ None were previously affiliated with government posts.

²⁴ In Mopti the broadcasts were done in 3 languages, 3 broadcast per day, 70 days, 12 radios, (7,560 = 3 X 3 X 70 X 12)

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
I.6.3	Number of people reached with vector control and/or SBCC messages via door-to-door messaging	Project Records Annually	VC Intervention Type Sex Male Female	772,376	N/A ²⁵								
I.6.4	Number and percentage of people who feel that the proposed action (sleeping under an ITN/accepting IRS) will reduce their risk of malaria	Project Records Annually		N/A	N/A								
I.6.5	Number and percentage of people with a favorable attitude toward the practice/product (i.e., ITNs, IRS)	Project Records Annually	VC Intervention Type	N/A	N/A								
I.6.6	Number and percentage of people who believe that the majority of their friends and community members practice the behavior	Project Records Annually	VC Intervention Type	N/A	N/A								
I.7	Environmental compliance												
I.7.1	SEAs (with EMMPs) or Letter Report submitted at least 60 days prior to the commencement of vector control campaigns	Project Records Annually		1; 100%	1; 100%								
I.7.2	Number and percentage of permanent and mobile soak pits inspected and approved prior to IRS campaigns	Project Records Annually	Soak Pit Type Affiliation of inspectors	63; 100% Mobile Soak pits: 20	62; 100% Mobile Soak pits: 12 10 ²⁶								
I.7.3	Number and percentage of storehouses inspected and approved prior to IRS campaigns	Project Records Annually	Storehouse Type Affiliation of inspectors	Storehouse: 49; 100%	49 ²⁷ ; 100% 10 ²⁸								

²⁵Door to door during community mobilization was completed. However, mobilizers were selected on the basis of their influence in the community, and literacy was not required. Therefore VL Mali is unable to accurately quantify the number of people reached through mobilization.

²⁶ECO (1), DNACPN (3), DRACPN (2), SACPN (4)

²⁷47 storehouses and 2 warehouses

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
1.7.4	Number and percentage of fixed soak pits that are compliant with PMI's Best Management Practices	Project Records Annually	Affiliation of inspectors	43; 100%	50 ²⁹ ; 100%								
2. Entomological and Epidemiological Data to Drive Decision-Making													
2.1 Vector control activities monitored via entomological and epidemiological data													
2.1.1	Number and percentage of project-supported entomological sentinel sites established to monitor vector bionomics and behavior (vector species, distribution, seasonality, feeding time, and location)	Entomological Reports ³⁰ Annually	VC Intervention Type	14; 100%	7; 100%								
2.1.2	Number and percentage of entomological monitoring sentinel sites measuring all five basic PMI entomological monitoring indicators (i.e., species composition, abundance, and seasonality of malaria vector; insecticide susceptibility and resistance intensity; mechanism of resistance; quality assurance and residual efficacy monitoring of IRS programs; or vector behavior: feeding time & location)	Entomological Reports Annually	VC Intervention	14; 100%	7; 100%								
2.1.3	Number and percentage of entomological monitoring sentinel sites measuring at least one advanced PMI indicator (i.e., identification of mosquito infectivity; parity rates; or blood-meal analysis)	Entomological Reports Annually	VC Intervention	14; 100%	7; 100%								

²⁸ECO (1), DNACPN (3), DRACPN (2), SACPN (4)

²⁹Inspectors are the same as those listed in indicator 1.7.2.

³⁰Entomological Reports will be submitted to PMI per the schedule outlined in the corresponding year's work plan. Once approved by PMI, reports will be translated into French and shared with NMCP for dissemination.

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.1.4	Number and percentage of insecticide resistance testing sites that tested at least one insecticide from pyrethroid, organophosphate, carbamate, clothianidin, and chlorfenapyr insecticides	Entomological Reports Annually	Insecticide Type	14;100%	14;100% Pyrethroid 14 Organophosphate 13 Carbamate 7 Clothianidin 4								
2.1.5	Number of wall bioassays conducted within 2 weeks of spraying to evaluate the quality of IRS	Entomological Reports Annually		20 walls	24 walls								
2.1.6	Number and percentage of cone bioassays conducted within two weeks of spraying with greater than 98% test mortality recorded	Entomological Reports Annually		20; 100%	24;100%								
2.1.7	Number of wall bioassays conducted after the completion of spraying at monthly intervals to evaluate insecticide decay	Entomological Reports Annually	Insecticide Type	4 districts; 20 houses; Actellic and Sumi shield	4 districts; 10 walls for Actellic and Sumi shield								
2.1.8	Number of vector susceptibility tests for different insecticides conducted in selected sentinel sites	Entomological Reports Annually	Insecticide Type	4 replicates per insecticides	13 tests for 5 insecticides ³¹								

³¹Permethrin (Diagnostic Concentration [DC], PiperonylButoxide [PBO] + DC, 5xDC, 10xDC); Deltamethrin (DC, PBO+DC, 5xDC, 10xDC); Alphacypermethrin (DC, 5xDC, 10xDC); Bendiocarb; Pirimiphos-methyl

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.1.9	Integrated vector control analytics dashboard available for decision making	Project Records Annually		N/A	N/A								
2.1.10	Number of staff (VectorLink-contracted or non-VectorLink) trained in entomological monitoring	Project Training Records Annually	Sex (# and %) Government Affiliation Female Male	18	18 ³² 4; 22.2% 14; 77.8%								
2.2	NMCPs develop country-level IRS and other malaria vector control strategies												
2.2.1	Developed an integrated malaria vector control strategy, including a plan for monitoring and managing insecticide resistance supported by the project	Project Records Annually		1	Not Completed								
2.2.2	Completed integrated data and visualization landscaping for vector control decision making complete	Project Records Annually		1; 100%	Not Completed								
2.2.3	Implemented sub-national insecticide rotation as part of an IRM strategy	Project Records Annually		Completed;	Completed								
2.3	Build capacity of NMCPs and local institutions to collect, analyze, and use data for strategic malaria control decision-making												
2.3.1	Number of individuals trained from NMCPs and national institutions to review and interpret data for integrated vector control decision making	Project Training Records Annually	Job Function Government Affiliation	N/A ³³	N/A								
2.3.1b	Number of government-affiliated staff participating in entomological monitoring activities (insecticide resistance testing and IRS quality assessment) ³⁴	Project Records Annually	Sex (# and %) Job Function	1 ³⁵	1								

³²VL Entomologist (2), NMCP (1) Technicians Entomologist (15).

³³ This indicator is in the global PMP but pertains only to country programs integrating new data systems in a given year. The indicator is not applicable to Mali in Year 1 but may be relevant in future years.

³⁴ Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

³⁵ NMCP (1).

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
2.3.2	Proportion of targeted individuals who report using new analytical tools and/or skills in their planning, resourcing, implementation, or measurement activities	Capacity Assessments Thrice Over Project Life	Job Function Organization	N/A	N/A								
3. Procure insecticides for IRS and support the delivery and storage of IRS and other malaria vector control products													
3.1 Cost-effective procurement mechanism established													
3.1.1	Number and percentage of insecticide procurements that had a pre-shipment QA/QC test at least 60 days prior to spray campaign	Procurement Records Annually	Insecticide Type	2; 100%	1; 100%								
3.1.2	Number and percentage of insecticide procurements received on-time to allow for the initiation of spray operations as scheduled	Procurement Records Annually	Insecticide Type	2; 100%	1; 100%								
3.1.3	Number and percentage of international equipment procurements, including PPE, received on-time to allow for the initiation of vector control campaigns as scheduled	Procurement Records Annually	VC Intervention Type	1; 100%	1								
3.1.4	Number and percentage of local procurements for PPE received on-time to allow for the initiation of spray operations as scheduled	Procurement Records Annually		1; 100%	1								
3.1.5	PPE procured according to workforce composition	Procurement Records Annually		N/A	N/A								
3.2 Robust inventory management and logistics systems established													
3.2.1	Number and percentage of logistics and warehouse managers trained in vector control supply chain management	Project Training Records Annually	VC Intervention Type Sex	1	1								
3.2.2	Number and percentage of operations site warehouses where physical inventories can be verified by daily stock records	Inventory and Stock Records Annually	Insecticide Type	49; 100%	48; 100%								
3.2.3	Successfully completed spray operations without an insecticide stock-out	Inventory and Stock Records Annually	Insecticide Type	1; 100%	Not completed								

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results										
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5		
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result	
4. Innovation														
4.1 Conduct operational research or monitoring to scale up new tools, methods, and approaches														
4.1.1	Number of operational research studies on promising new tools or new methods/approaches to existing tools that are implemented	Project Records Annually	Type of Innovation	N/A	N/A									
4.2 Create and share knowledge through dissemination of best practices and lessons learned														
4.2.1	Number of innovations, best practices, and other data or lessons learned shared with other partners or international institutions for global reporting on the Vector Learning Exchange	Project Records Annually	Technical Area	N/A	In progress ³⁶									
4.2.1 b	Number of times innovations, best practices, and other data or lessons learned are presented by and/or shared with in-country partners ³⁷	Project Records Annually	Technical Area	I ³⁸	In progress ³⁹									
4.2.2	Number of individual members who use the Vector Learning Exchange	Project Records Annually	N/A	TBD	In progress ⁴⁰									
4.2.3	Number of symposia and/or presentations submitted to and accepted at global conferences	Project Records Annually	Technical Area	TBD	I ⁴¹									
4.2.4	Number of success stories written or videos produced and shared on the VectorLink project website	Project Records Annually		TBD	0									
4.2.5	Number of peer-reviewed journal articles submitted and accepted	Project Records Annually	Technical Area	I ⁴²	I ⁴³									

³⁶ Epidemiology. ³⁷ Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

³⁷ Indicator added at request of PMI/Mali mission; not a VectorLink contractually-mandated indicator.

³⁸ Share with in country partners ours e-Inventory.

³⁹ Epidemiology

⁴⁰ VL Mali permanent staff are registering after the approval of the End of Spray Report.

⁴¹ VL Mali Entomologist participated in ASTMH.

⁴² Submit one entomological article.

⁴³ Entomology

#	Performance Indicator	Data Source(s) and Reporting Frequency	Disaggregation(s)	Annual Targets and Results									
				Year 1 ⁴		Year 2		Year 3		Year 4		Year 5	
				Target	Result	Target	Result	Target	Result	Target	Result	Target	Result
4.2.6	Number of critical guidance, standards, or plans that incorporate disseminated findings/best practices and are shared with national stakeholders	Project Records Annually	Technical Area	⁴⁴	In progress ⁴⁵								
4.3	Develop and deploy cost-savings approaches												
4.3.1	Number of innovative or novel approaches implemented to achieve cost savings in IRS and integrated malaria vector control programs	Project Records Annually	VC Intervention Type	N/A	N/A								
4.3.2	Number of cost effectiveness assessments of existing approaches in the implementation of IRS and integrated malaria vector control programs	Project Records Annually	VC Intervention Type	N/A	N/A								
4.4	Cultivate public-private partnerships												
4.4.1	Number of private sector entities engaged with to establish public-private partnerships to increase the quality and coverage of malaria vector control activities globally	Project Records Annually	Private Sector Organization		⁴⁶								

⁴⁴Share IRS impact in Mopti.

⁴⁵Epidemiology

⁴⁶UMAPLAST (Unite Malienne des Plastiques)

ANNEX G: PSECA FINDINGS AND RECOMMENDATIONS

TABLE G-I: PSECA FINDINGS: MOPTI DISTRICT

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Manako	<ul style="list-style-type: none"> - a store of three room is available to be the IRS store - the site is an adequate distance from the sensitive receptor - the store has a leak-free floor and roof - the wash area is near to the store - the doors and windows are in good condition - two toilets are available - the store and wash area are fenced 	<ul style="list-style-type: none"> - one store window is missing a screen - antidote unavailable - cracks in the floor and wall of wash area - the fence and soak pit are missing locks - the wall of wash area is a bit short - the fence is sagging 	<ul style="list-style-type: none"> - replace the screen - provide the antidote - repair the floor and wall of the wash area - lock the fence and soak pit - add a row of bricks to the wall of the wash area - repair the fence 	April 18
Fatoma	<ul style="list-style-type: none"> - a store of one room (7/10 m) is available - the store is near the wash area - the site is an adequate distance from the sensitive receptors - the roof is in good condition - the door and the windows are in good condition - antidote is available - presence of the both men and womens' toilet 	<ul style="list-style-type: none"> - cracks in the floor of the store - cracks in the floor and the wall of wash area - one store window is missing a screen - absence of a double lock at the store and soak pit - wall of the wash area is bit short 	<ul style="list-style-type: none"> - repair the cracks in the floor of the store - repair the cracks in the wash area - replace the screen - put a double lock on the store, soak pit - add a row of bricks to the wall of the wash area - fence the store and wash area 	April 18
Sampara	<ul style="list-style-type: none"> - a house of two rooms is available - the floor and the roof leak - the store and wash area sites are an adequate distance from the sensitive receptors - the door is in good condition - both toilet are present - the store and wash area are fenced - the windows have bars 	<ul style="list-style-type: none"> - cracks in the floor and wall of the wash area - fence has no lock - antidote unavailable - windows are not screened 	<ul style="list-style-type: none"> - repair the floor and wall of the wash area - put a double lock on the fence - provide the antidote - put screens on the windows 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Niacongo	<ul style="list-style-type: none"> - a house of two rooms is available - the store and wash area sites are an adequate distance from the sensitive receptors - the storeroom has a roof and the floor in good condition - the store is fenced - the doors and the windows are in good condition - both toilet are present - the store and wash area are fenced - the windows have bars - the site of the wash area is near the store 	<ul style="list-style-type: none"> - windows are not screened - door has no lock - antidote unavailable - cracks in the floor and the wall of the wash area - need to build new toilet 	<ul style="list-style-type: none"> - put screens and bars on the windows - lock the door - provide the antidote - repair the floor and wall of the wash area - build two new toilets 	April 18
Somadougou	<ul style="list-style-type: none"> - a house of five rooms is available - the store and wash area sites are an adequate distance from the sensitive receptors - surrounding area is clean - the store is near the wash area site - the doors and windows are in good condition - the windows have bars and screens - the floor and roof leak 	<ul style="list-style-type: none"> - cracks in the floor of wash area - the store has no fence - antidote unavailable - the fence has no lock - need to repair the toilet 	<ul style="list-style-type: none"> - repair the cracks in the wash area - fence the store - provide the antidote - repair the toilet 	April 18
Soufroulalye	<ul style="list-style-type: none"> - a store of three rooms is available - the site is an adequate distance from the sensitive receptor - the store has a leak-free floor and roof - the wash area is near the store - the doors and windows are in good condition - store windows have either bars or screens - presence of toilet in the site - the store and wash area are fenced 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the wash area - presence of herbs in the wash area 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - weed the wash area 	April 18
Konna	<ul style="list-style-type: none"> - a house of five rooms is available - the site is an adequate distance from the sensitive receptors - the doors and windows are in good condition - the floor and roof in good condition - the wash area is near the store - the store and wash area are fenced - antidote is available - store windows are either barred and screened - presence of toilet in the site - the store and wash area are fenced 	<ul style="list-style-type: none"> - presence of herbs in the wash area - antidote unavailable - cracks in the floor of the wash area and wall - the wall of wash area is bit short - the fence is sagging 	<ul style="list-style-type: none"> - weed the wash area - provide the antidote - repair the floor and wall of the wash area - add a row of bricks to the wall of wash area - repair the fence 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Diambacourou	<ul style="list-style-type: none"> - a house of three rooms available to be IRS store - the sites of the store and wash area are an adequate distance from the sensitive receptors - store roof is in good condition - the wash area is near the store - both toilets are in good condition - the roof and floor are in good condition - the wash area and store are fenced 	<ul style="list-style-type: none"> - windows have no screens or bars - antidote unavailable - cracks in the floor and wall of the wash area - the fence is relaxed - no locks on the fence 	<ul style="list-style-type: none"> - put bars and screens on the windows - provide the antidote - repair the floor and wall of wash area - repair the fence - put the locks on the fence 	April 18
Tongorogon	<ul style="list-style-type: none"> - a big house of one room is available as IRS store - the sites of the store and wash area are an adequate distance from the sensitive receptors - the roof and the floor are in good condition - the store and wash area are fenced - the store has very good ventilation - there are two toilets 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor of wash area - the wall of wash area is a bit short - the soak pit need to be repaired 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - add a row of brick at the wall of wash area - repair the soak pit 	April 18
Sevaré II	<ul style="list-style-type: none"> - a house of one big room available - the site is an adequate distance from the sensitive receptors - the store has a roof - the windows have bars and screens - antidote available - the wash area is near the store - presence of two toilets - the wash area and the store are fenced - the roof and floor in good condition - the store is double locked 	<ul style="list-style-type: none"> - cracks in the floor and wall of wash area - one part of the fence is out - the soak pit is not closed 	<ul style="list-style-type: none"> - repair the floor and wall of wash area - repair the fence - close the soak pit 	April 18
Socoura	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the store and wash area are an adequate distance from the sensitive receptors - the store and wash area are located within the fence and are well cleaned - windows have bars and screens - the store is well aerated and ventilated - the walls outside and inside well rough casted - antidote is available - the roof and the floor are in good condition - presence of toilets 	<ul style="list-style-type: none"> - cracks in the floor of the wash area - need to fix the clothes line - the soak pit and fence have no locks 	<ul style="list-style-type: none"> - repair the floor of the wash area - fix the line - lock the soak pit and the fence 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Sevaré III	<ul style="list-style-type: none"> - a house of one room is available to be IRS store - the site is an adequate distance from the sensitive receptors - the store roof and floor are in good condition - the wall outside and inside are well rough casted - the store is fenced -the windows are screened and barred - the door has a padlock 			April 18
Medina Coura	<ul style="list-style-type: none"> - a house of six rooms is available to be IRS store - the store and wash area are an adequate distance from the sensitive receptors - the store and wash area are within the fence and well cleaned - the store is well aerated and ventilated - the wall outside and inside is well rough casted - both health areas share the same building 	<ul style="list-style-type: none"> - there are cracks in the wall and the floor of store and the wash area - the doors are missing padlocks - antidote no available 	<ul style="list-style-type: none"> - repair the floor of store and the wash area -put new padlocks on the doors -provide the antidote 	April 18
Toguel	<ul style="list-style-type: none"> - there are toilets - the roof of the store is in good condition - this site receives the wash areas and fixed soak pits of Medina Coura, Toguel, Komoguel, and Ascotamb 			
Komoguel	<ul style="list-style-type: none"> - a big house with five rooms is available to be IRS store - the store and the wash area are an adequate distance from the sensitive receptors - antidote available in the both health centers - the store is well aerated and ventilated 	<ul style="list-style-type: none"> - the windows need repair 	<ul style="list-style-type: none"> - repair the windows 	April 18
Ascotamb	<ul style="list-style-type: none"> - the wall outside and inside is well rough casted - presence of toilet - the windows are well screened and barred 			

TABLE G-2: PSECA FINDINGS: BANDIAGARA DISTRICT

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Dourou	<ul style="list-style-type: none"> - a store of three rooms is available to be IRS store - the site is an adequate distance from the sensitive receptor - the wash area is not far from the store - the doors and windows are in good condition - the roof and floor of the store are in good condition - the windows are screened and barred - the store and wash area are fenced - there are two toilets 	<ul style="list-style-type: none"> - cracks in the floor wash area - the store and wash area are missing padlocks - absence of antidote - presence of herbs in wash area 	<ul style="list-style-type: none"> - repair the floor of wash area - put a padlock at the store and wash area - provide the antidote - repair the floor of store - clean the wash area 	April 18
Bandiagara	<ul style="list-style-type: none"> - a big house is available to be IRS storeroom - the wash area is near the store - the site is an adequate distance from the sensitive receptors - the roof is in good condition - the store has a leak-free floor - the door and the windows are in good condition - antidote available - the floor and roof are in good condition - the windows are screened and barred - presence of the toilet - the store is fenced 	<ul style="list-style-type: none"> - absence of wash area and soak pit 	<ul style="list-style-type: none"> - build the wash area and a fixed soak pit 	April 18
lby	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS storeroom - the site of the future wash area is identified and near the store - the roof in good condition - the sites of store and wash area are an adequate distance from the sensitive receptors - the door in good condition - the windows are screened and barred - there are two toilets - the floor of the store is in good condition 	<ul style="list-style-type: none"> - cracks in the floor and wall of the wash area - the wall of the wash area bit short - antidote unavailable - the store no fenced 	<ul style="list-style-type: none"> - repair the floor and wall of the store - add a row of bricks at the wall of the wash area - provide the antidote - build the wash area and a fixed soak pit - fence the store 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Irely	<ul style="list-style-type: none"> - a house of rooms is available as IRS store - the store and wash area are an adequate distance from the sensitive receptors - the store is near the wash area - the windows are barred and screened - the store has a double padlock - the roof and the floor of the store leak - there are two toilets 	<ul style="list-style-type: none"> -antidote unavailable - cracks in the floor and wall of the wash area - the wall of the wash area bit short - the soak pit needs to be repaired 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - add a row of bricks to the wall of the wash area 	April 18
Sangha	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the windows are screened and barred - the door has a double padlock - antidote available - the sites of store and wash area are an adequate distance from the sensitive receptors - the storeroom has the roof and the floor is in good condition - the store is fenced - the doors and the windows are in good condition - the wash area is near the store 	<ul style="list-style-type: none"> - the soak pit needs to be repaired - padlocks are absent at the soak pit and fence - the fence is sagging 	<ul style="list-style-type: none"> - repair the soak pit - put the padlock at the soak pit and fence - repair the fence 	April 18
Kamba	<ul style="list-style-type: none"> - a house of one room (3,5/6 m) is available to be IRS store - the store and wash area sites are an adequate distance from the sensitive receptors - store surrounding area cleaned - the doors and windows are in good condition - the windows are screened and barred - the store is fenced - the roof and the floor of the store are in good condition 	<ul style="list-style-type: none"> - antidote unavailable - impossible to dig at depth of one meter, because of the rock 	<ul style="list-style-type: none"> - provide the antidote - use a mobile soak pit in this site 	April 18
Kendié	<ul style="list-style-type: none"> - a house of four rooms is available to be IRS store - the store and wash area sites are an adequate distance from the sensitive receptors - the store is near to wash area - the storeroom is well aerated and well ventilated - the store is fenced - the wash area is near the store - the windows are screened and barred 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor of the wash area and store - the door of store needs to be repaired - the door is missing a padlock 	<ul style="list-style-type: none"> - provide the antidote - repair the cracks in floor of the store and wash area - put a double padlock on the door 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Bendiely	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the store and wash area are an adequate distance from the sensitive receptors -the store is fenced and the roof is in good condition - the windows are screened and barred - the store has a double padlock - the site of wash area is identified 	<ul style="list-style-type: none"> - the racks in the floor of store - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor of store - provide the antidote - build a fixed soak pit and wash area 	April 18
Mory	<ul style="list-style-type: none"> - a house of one room is available to be IRS store - the store is an adequate distance from the sensitive receptors - the storeroom roof in good condition - the windows and door are in good condition - the store is located in the fence - windows are screened and barred 	<ul style="list-style-type: none"> - antidote not available - the soil is rocky, impossible to dig to depth of one meter 	<ul style="list-style-type: none"> - provide the antidote - use a mobile soak pit 	April 18
Deh	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the store and wash area are an adequate distance from the sensitive receptors - storeroom floor is in good condition - the windows are barred and screened - the store is fenced 	<ul style="list-style-type: none"> - the floor of the wash area needs to be repaired - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor of the wash area - provide the antidote 	April 18
Ningari	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the site is an adequate distance from the sensitive receptors - the doors and windows are in good condition - the roof of the store are in good condition - the window is screened and barred - the site of the wash area is identified - the store is fenced 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor of the store 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the store - build a fixed soak pit and wash area 	April 18
KaniGogouna	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the store and wash area site are an adequate distance from the sensitive receptors - the store roof and floor are in good condition - the wash area is near the store - the store is located inside the fence - the windows are screened and barred 	<ul style="list-style-type: none"> - antidote unavailable - there are cracks in the floor and wall of the wash area - the line needs to be repaired 	<ul style="list-style-type: none"> - provide the antidote - repair the floor and wall of the wash area - repair the line 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Nando	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the store is an adequate distance from the sensitive receptors - the site of wash area is near the store - the store has the roof in good condition - the windows are screened and barred - both toilet are available 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the wash area - herbs are growing in fence of wash area - the soak pit and fence are missing padlocks - the soak pit needs to be repaired 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of wash area - clean the wash area - put padlocks on the soak pit and the fence - repair the soak pit 	April 18
Diangassagou	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the store is an adequate distance from the sensitive receptors - the store has a roof - the wash area is near the store - the windows are screened and barred - presence of the both toilets - presence of danger sign - the wall outside and inside is well rough casted - the store is fenced 	<ul style="list-style-type: none"> - cracks in the floor and wall of store - cracks in the floor of the wash area - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor and wall of the store - repair the floor of the wash area - provide the antidote - build the wash area and fixed soak pit and fence them 	April 18
Ouo	<ul style="list-style-type: none"> - a house of two big rooms is available to be IRS store - the store and wash area sites are an adequate distance from the sensitive receptors - the store is well aerated and ventilated - the wall outside and inside is well rough casted - there are padlocks on the door of the store - the store is fenced - the site of the wash area is identified 	<ul style="list-style-type: none"> - cracks in the floor of the store - antidote not available 	<ul style="list-style-type: none"> - repair the floor - provide the antidote - build a fixed soak pit 	April 18
Djiguibombo	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the store is an adequate distance from the sensitive receptors - the door of the store has padlocks - the store is fenced - the windows are screened and barred 	<ul style="list-style-type: none"> - the roof of the store needs to repair - antidote unavailable - the soil is rocky, impossible to dig at the depth of one meter 	<ul style="list-style-type: none"> - repair the roof of the store - provide the antidote - use a mobile soak pit in this site 	April 18

Sites	Strengths	Areas for Improvement	Recommendations/ Repair Needed	Repair Deadline
Songho	<ul style="list-style-type: none"> - a house of three rooms is available to be IRS store - the store and wash area site are an adequate distance from the sensitive receptors - the store and wash area site are located in the fence and well cleaned - the store well is aerated and ventilated - the windows are screened and barred - the store is fenced 	<ul style="list-style-type: none"> - cracks in the floor of wash area - antidote not available 	<ul style="list-style-type: none"> - repair the floor of the wash area - provide the antidote - put a double padlock on the door 	April 18
Kori-Maounde	<ul style="list-style-type: none"> - a big house of two rooms is available to be IRS store - the store and wash area site are an adequate distance from the sensitive receptors - the store is well aerated and ventilated - the windows are screened and barred - the store is fenced - the roof of store are in good condition - the door and fence have padlocks 	<ul style="list-style-type: none"> - antidote no available - the fence is sagging - the soil is rocky; impossible to dig to a depth of one meter 	<ul style="list-style-type: none"> - repair store's floor - repair the fence - provide the antidote - use a mobile soak pit in this site 	April 18
Goundaka	<ul style="list-style-type: none"> - a house of three rooms is available to be IRS store - the store and wash area sites are an adequate distance from the sensitive receptors - the store and wash area sites are fenced and well cleaned - the store is well aerated and ventilated - the windows are barred 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor of the wash area - the windows are not screened - presence of herbs in wash area 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - put the screen at the windows - clean the wash area 	April 18

TABLE G-3: PSECA FINDINGS: DJENNÉ DISTRICT

Sites	Strengths	Areas for Improvement	Recommendations / Repair Needed	Repair Deadline
Djenné	<ul style="list-style-type: none"> -a house of one big room is available to be IRS store the windows are screened and barred - the door has a double padlock - antidote available - the store and wash area are an adequate distance from the sensitive receptors -the storeroom roof and floor are in good condition - the doors and the windows are in good condition - the wash area is near the store 	<ul style="list-style-type: none"> - no wash area and soak pit - the store no fenced 	<ul style="list-style-type: none"> - repair the floor - build the wash area and a fixed soak pit - fence the store and wash area 	April 18
Bonguel	<ul style="list-style-type: none"> - a house with two rooms is available to be IRS store - the windows areand barred - the door has a double padlock - the store is fenced - the store and wash area are an adequate distance from the sensitive receptors - the storeroom roof is in good condition - the doors and the windows are in good condition - the wash area is near the store 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor and wall of the store - cracks in the floor of the wash area - the windows are not screened - presence of herbs in wash area 	<ul style="list-style-type: none"> - provide the antidote - repair the floor and wall of the store - repair the floor of the wash area - put the screen at the window - clean the wash area 	April 18
Sofara	<ul style="list-style-type: none"> - a house of three rooms is available to be IRS storeroom - the wash area is identified and near the store - the roof in good condition - the store and wash area are an adequate distance from the sensitive receptors - the door has a padlock - the roof and floor are in good condition 	<ul style="list-style-type: none"> - the cracks in the floor and the wall of the wash area - the soak pit needs to be repaired - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor and wall of the wash area - repair the soak pit - provide the antidote 	April 18
Torokoro	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the door is in good condition - antidote available - the store and wash area are an adequate distance from the sensitive receptors - the wash area is near the store 	<ul style="list-style-type: none"> - cracks in the floor of the wash area - antidote unavailable - the soak pit needs to be repaired 	<ul style="list-style-type: none"> - repair the floor - provide the antidote - repair the fixed soak pit 	April 18

Sites	Strengths	Areas for Improvement	Recommendations / Repair Needed	Repair Deadline
Konio	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the store and wash area sites are an adequate distance from the sensitive receptors - the store surrounding area cleaned - the doors and windows are in good condition - the floor in a good condition 	<ul style="list-style-type: none"> - antidote unavailable - the cracks in the floor and the wall of the wash area - the wall of the wash area bit short - the soak pit needs to be repaired 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - add a row of bricks to the wall of the wash area - repair the soak pit 	April 18
Madiama	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the windows are screened and barred - the door has a double padlock - the store is fenced - the store and wash area are an adequate distance from the sensitive receptors - the storeroom roof is in good condition - the doors and the windows are in good condition - the wash area is near the store 	<ul style="list-style-type: none"> - cracks in the floor of wash area - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor of wash area - provide the antidote 	April 18
Senossa	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the windows are screened and barred - the door has a double padlock - the store and wash area are an adequate distance from the sensitive receptors - the storeroom roof is in good condition - the store is fenced - the doors and windows are in good condition - the wash area is near the store 	<ul style="list-style-type: none"> - cracks in the floor of wash area - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor of wash area - provide the antidote 	April 18

TABLE G-4: PSECA FINDINGS: BANKASS DISTRICT

Sites	Strengths	Areas for Improvement	Recommendations / Repair Needed	Repair Deadline
Bankass central	<ul style="list-style-type: none"> - a house of one big room is available to be IRS store - the windows are screened and barred - the door has a double padlock - antidote available - the store and wash area are an adequate distance from the sensitive receptors -the storeroom floor are in good condition - the doors and the windows are in good condition - the site of the wash area is near the store 	<ul style="list-style-type: none"> - no bars and screen on the windows - the roof needs repair - cracks in the wash area - soak pit obstructed by mud - the fence is sagging 	<ul style="list-style-type: none"> - put the bars and screens on the windows - repair the roof of the store - repair the wash area and soak pit - tighten the fence of the wash area 	April 18
Baye	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the windows are screened and barred - the door has a double padlock - the store is fenced - the store and wash area site are an adequate distance from the sensitive receptors - the storeroom roof is in good condition - the doors and the windows are in good condition - the wash area is near the store - presence of toilet 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor of the wash area - presence of herbs in wash area - the soak pit in a bad condition 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - clean the wash area - repair the soak pit 	April 18
Pissa	<ul style="list-style-type: none"> - a house of one big room is available to be IRS storeroom - the wash area is identified and near the store - the roof is in good condition - the store and wash area are an adequate distance from the sensitive receptors - the door has a padlock - the roof is in good condition 	<ul style="list-style-type: none"> - the cracks in the floor and the wall of the wash area and store - the soak pit needs to repair - antidote unavailable 	<ul style="list-style-type: none"> - repair the floor and wall of the wash area and the store - repair the soak pit - provide the antidote 	April 18

Sites	Strengths	Areas for Improvement	Recommendations / Repair Needed	Repair Deadline
Niamia	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the door is in good condition - antidote available - the store and wash area site are an adequate distance from the sensitive receptors - the wash area is near the store 	<ul style="list-style-type: none"> - cracks in the floor of the wash area - antidote unavailable - the soak pit needs to be repaired 	<ul style="list-style-type: none"> - repair the floor - provide the antidote - repair fixed soak pit 	April 18
Diallassagou	<ul style="list-style-type: none"> - a house of two rooms is available to be IRS store - the sites of store and wash area are an adequate distance from the sensitive receptors - the surrounding area is clean - the doors and windows are in good condition - the floor in good condition 	<ul style="list-style-type: none"> - antidote unavailable - cracks in the floor and wall of the wash area - the wall of the wash area is a bit short - the soak pit needs to be repaired 	<ul style="list-style-type: none"> - provide the antidote - repair the floor of the wash area - add a row of bricks to the wall of the wash area - repair the soak pit 	April 18

ANNEX H: ENVIRONMENTAL MITIGATION AND MONITORING REPORT (EMMR)

Implementing Organization: Vector Link Mali

Geographic location of USAID-funded activities: Bandiagara, Bankass, Djenné, and Mopti districts

Period covered by this Reporting Form and Certification: November 2018

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
Ia. Pre-contract inspection and certification of vehicles used for pesticide or spray team transport.	Inspection of 31 vehicles and 36 taxinis involved in the IRS campaign took place on August 26, 2018 for drivers of the seven health areas of Mopti ville and the health areas of Bankass Central, Bandiagara Central, and Djenné Central. For the other 36 health areas, an inspection of 43 vehicles took place on September 3.		The taxini has a particular status in Mali. Checklists were modified to include taxinis. All taxini were inspected and approved by the ECO before use by the IRS campaign.
Ib. Driver training.	All drivers of the seven health areas of Mopti ville and the health areas of Bankass Central, Bandiagara Central, and Djenné Central received training on August 25, 2018. In the other 36 health areas, drivers received training on September 2. This training concerned the correct methods to secure and safely handle insecticides (including taxini drivers).		All the drivers involved in the 2018 IRS campaign signed Abt policy on motor vehicles, and they received their certificate from the ECO.
Ic. Cell phone, personal protective equipment (PPE) and spill kits on board during pesticide transportation.	Each driver of each vehicle used for the transport of insecticides was provided with PPE, spill kits, and first aid kits.		Drivers were required to use their personal cell phones while transporting insecticides.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
Id. Initial and 30-day pregnancy testing for female candidates for jobs with potential pesticide contact.	DTCs completed the pregnancy tests of each female candidate for SOP, team leader, local supervisor, storekeeper, maintainer, and washer.		All test results were sent to the ECO. The tests were completed during the SOP training, to ensure pregnant women were not recruited for positions with potential pesticide contact.
Ie. Health fitness testing for all operators.	Testing completed for each SOP, storekeeper, and team leader.		All test results were sent to the ECO before the start of the campaign.
If. Procurement of, distribution to, and training on the use of PPE for all workers with potential pesticide contact.	All workers with the potential to come in contact with pesticides were provided with PPE and trained on the proper use of the PPE.		Field supervision by supervisors and team leaders confirmed the appropriate use of PPE to ensure the safety of project personnel.
Ig. Training on mixing pesticides and the proper use and maintenance of spray pumps.	SOP training including pesticide mixing, pump maintenance, and proper use of spray pumps took place July 3-5 and August 28-29, 2018.		AIRS Mali increased the number of pump mechanics during the campaign to assist SOPs with pump maintenance.
Ih. Provision of adequate facilities and supplies for end-of-day clean-up.	The ECO inspected all wash areas and soak pits for end-of-day clean-up prior to the start of the campaign. The inspections included coordinating with the operations manager to ensure the provision of adequate facilities and supplies.		The initial and final preseason environmental compliance assessments are designed to ensure facilities and supplies are appropriate for campaign activities.
Ii. Enforcement of spray and clean-up procedures.	Spray and clean-up procedures are enforced by the team leaders and supervisors. Enforcement is often captured via supervisory checklists.		Storekeepers have an additional responsibilities overseeing SOPs' end-of-day activities.
2a. IEC campaigns to inform homeowners of responsibilities and precautions.	VL Mali used radio broadcasts to ensure wide dissemination of IRS spray campaign information.		The roles of local IRS mobilizers and village local mobilizers are very important. The efforts of the mobilizers helped to reduce spray refusal cases.
2b. Prohibition of spraying houses that are not properly prepared.	SOPs are instructed during training not to spray homes unprepared for spray.		Team leaders oversee structure preparation before spraying. The role of local mobilizers is very important to assist homeowners with preparation before the sprayers arrive.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
2c. Two-hour exclusion from house after spraying.	Homeowners are informed during mobilization and after spray, to wait two hours before entering the home and to open the door along with the windows.		The homeowners observed two hours before opening the door and windows.
2d. Instruct homeowners to wash itchy skin and go to health clinic if symptoms do not subside.	Homeowners are reminded by SOPs and team leaders to wash itchy skin and go to health clinic if symptoms do not subside.		
3a. Indoor spraying only.	SOPs are trained to spray inside walls of homes only. This training is reinforced by the project teams and onsite supervision.		
3b. Training on proper spray technique.	The SOP training includes proper spray technique and methods to overcome challenging spray areas. Training is managed by the project teams, COP, and operations manager. Inspections to ensure proper technique are completed by supervisors and the ECO.		Team leaders, supervisors, and the ECO use the Homeowner Preparation and Spray Operator Performance Supervisory Form to note spray technique inspections.
3c. Maintenance of pumps.	Pump mechanics were recruited in each district for pump maintenance during the spray campaign.		VL Mali increased the number of pump mechanics during the campaign to assist SOPs with pump maintenance.
4a. Choose sites for disposal of liquid wastes, including mobile soak pit sites, according to PMI Best Management Practices (BMPs).	The initial and final PSEAs completed by the ECO are designed to ensure site locations according to PMI BMP.		
4b. Construct fixed and mobile soak pits with charcoal to absorb pesticide from rinse water.	Fixed and mobile soak pits were built and repaired with charcoal to absorb pesticide from rinse water.		Fixed and mobile soak pits were built with a combination of activated charcoal.
4c. Maintain soak pits as necessary during season.	Team leaders and supervisors completed daily inspections to ensure the proper drainage and good condition of soak pits.		Supervisors and team leaders used the End-of-Day Supervisory Form to note soak pit inspections.

Mitigation Measure	Status of Mitigation Measures	Outstanding Issues Relating To Required Conditions	Remarks
4d. Inspect and certify solid waste disposal sites before spray campaign.	The ECO inspects and certifies solid waste disposal sites during the PSECAs.		A MOE representative was involved with reviewing the solid waste disposal sites.
4e. Monitor waste storage and management during campaign.	The ECO supervised the collection and the storage of waste at the central warehouses in Mopti and Bankass.		A MOE representative was involved in the supervision waste management.
4f. Monitor disposal procedures post-campaign.	Monitoring will start October 21 according to the waste management plan in each health center.		
5a. Maintain records of all pesticide receipts, issuance, and return of empty bottles/sachets.	Records of all pesticide receipts, issuance, and return of empty bottles/sachets are recorded in the project stock card and dispatch record for insecticides and empty bottles/sachets.		The logistic supervisors inspect the insecticide stores to ensure stock card and dispatch records are maintained.
5b. Reconcile number of houses sprayed vs. number of bottles/sachets used.	Inspection and toolkit forms used by supervisors for reconciliation.		A MOE representative was involved in this supervision.
5c. Do a visual examination of houses sprayed to confirm pesticide application.	Visual examinations of the houses sprayed were done by the team leader, COP, operations manager, entomological coordinator, and ECO.		
5d. Perform physical inventory counts during the spray season.	Physical inventory counts were completed by the COP and operations manager during the spray campaign.		