EMERGENCY OPERATION DEVELOPMENT PROJECTS (EODP)

CHECKLIST ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

FOR

Electricity Distribution Network and Street Lighting, Road Rehabilitation and Storm Water Drain Project, Al-Samah and Yarimcha, Mosul, Ninawa Governorate

Component 10

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الملخص التنفيذى

1. مقدمة

قام مشروع التنمية الطارئ بالعراق بتوفير الدعم لمحافظة نينوى. وقد حددت خطة الإدارة البيئية والاجتماعية إطار عمل لتحديد التأثيرات البيئية والاجتماعية المحتملة ، وتدابير التخفيف ، وإجراءات المتابعة والرصد التي سيتم اتخاذها في خلال جميع مراحل المكونات الثلاثة التالية للمشروع (المشار إليها فيما يلي باسم "**المشروع الفرعي**") التي سوف تتم في منطقتي السماح واليرموك في مدينة الموصل بمحافظة نينوى:

- مشروع التنمية الطارئ في العراق EODP-AF-NIN-W04-A: ويشمل إعادة تأهيل وإعادة بناء شبكات توزيع الكهرباء العلوية وإنارة الشوارع في منطقتي السماح و اليرموك
- مشروع التنمية الطارئ في العراق EODP-AF-NIN-W04-B : ويتضمن إعادة تأهيل شبكة تصريف مياه الأمطار وتأهيل الشوارع في الجانب الشرقي من حي السماح.
- مشروع التنمية الطارئ في العراق: EODP-AF-NIN-W04-C : ويتضمن إعادة تأهيل شبكة تصريف مياه الأمطار وتأهيل الشوارع في الجهة الغربية من حي السماح.

يتكون مشروع التنمية الطارئ في العراق من عشرة مكونات ، ويقع المشروع المقترح في هذه الدراسة تحت المكون العاشر. وقد تم تفعيل السياسة التشغيلية للبنك الدولي رقم OP 4.01 بشأن التقييم البيئي حيث أن المشروع الفرعي المقترح له بعض التأثيرات البيئية والاجتماعية السلبية المحتملة. وبناءً على ذلك ، فإن خطة الإدارة البيئية والاجتماعية (ESMP) مطلوبة لتنفيذ المشروع الفرعي وفقًا لمتطلبات الإجراءات التشغيلية للبنك الدولي والتشريعات الوطنية العراقية السارية. وقد تم إعداد تلك الدراسة بناء على ما جاء في الدراسة الإطارية لمشروع التنمية الطارئ في العراق.

2. الإطار المؤسسى والتشريعى للمشروع

أ. السياسة الوطنية والقوانين والتشريعات والتنظيمات الإدارية

- **التشريعات البيئية**
  - القانون رقم 27 لسنة 2009: قانون حماية وتحسين البيئة
  - القانون رقم 37 لسنة 2008: قانون وزارة البيئة

- **التشريعات البيئية والإجتماعية التى تنطبق على المشروع**
  - اللائحة التنفيذية رقم 4 من عام 2012: الخاصة بجودة الهواء المحيط
  - قانون رقم 41 لسنة 2015: قانون السيطرة على الضوضاء

- القانون رقم 50 من العام 2008 : قانون وزارة الموارد المائيه
- القانون رقم 89 لسنة 1981 المعدل بالقرار رقم 54 لسنة 2001: قانون الصحة العامة
- نظام رقم 2 لسنة 2001: نظام الحفاظ على الموارد المائية
- تعليمات رقم. 2 لسنة 2014 بشأن حماية البيئة من النفايات البلدية
- الأمر التوجيهي رقم (67) لسنة 1986 بتنظيم مناطق تجميع الحطام
- تعليمات رقم (12) لسنة 2016 بشأن متطلبات الصحة والسلامة المهنية

- قانون رقم (6) لسنة 1988 بشأن الهيئة الوطنية للصحة والسلامة المهنية
- التعليمات رقم (4) لسنة 1993 بشأن الصحة المهنية ، وحماية العمال من الاهتزازات ، طبقاً للمادتين 3 و 105 من قانون الصحة العامة (رقم 89 لعام 1981)
- قانون رقم 37 لسنة 2015: قانون العمل العراقي

ب. الاتفاقيات الدولية ذات الصلة :

- اتفاقية الأمم المتحدة للتنوع البيولوجي (UNCBD) ؛
- اتفاقية الأمم المتحدة لمكافحة التصحر (UNCCD) ؛
- اتفاقية رامسار بشأن المناطق الرطبة ؛
- اتفاقية اليونسكو للتراث العالمي ؛
- اتفاقية الأمم المتحدة الإطارية بشأن تغير المناخ (UNFCCC) وبروتوكول كيوتو
- اتفاقيات منظمة العمل الدولية المتعلقة بالعمل

ج. السياسات الحمائية للبنك الدولي

حدد البنك الدولي 10 سياسات حماية بيئية واجتماعية ينبغي مراعاتها في المشروعات التى يتولى تمويلها. تم تصنيف المشروع المقترح على أنه من الفئة (ب) وفقًا للبنك الدولي ، وهذا يتطلب إعداد خطة إدارة بيئية واجتماعية .(ESMP) كما ينطبق على هذا المشروع أيضا السياسة التشغيلية رقم 4.01 والسياسة المتعلقة بالوصول إلى المعلومات.

3. وصف المشروع

أ. مدة المشروع

من المتوقع أن تبدأ المشاريع الفرعية الثلاثة في مارس 2020 وتنتهي بنهاية سبتمبر 2020. مدة المشروع أقل من سنة واحدة

ب. موقع المشروع

تقع منطقتي السماح و اليرموك على الضفة اليسرى لمدينة الموصل. وتعد مدينة الموصل من المدن الرئيسية بشمال العراق ، تقع على بعد 400 كيلومتر شمال بغداد ، في محافظة نينوى. تقع الموصل على الضفة الغربية لنهر دجلة ، كما هو مبين في الشكل أدناه..

شكل رقم1 : خريطة العراق وبها مدينة الموصل داخل محافظة نينوى

ج. مرحلة ما قبل الإنشاءات

تشمل أنشطة ما قبل الإنشاءات:

- الخطوة الأولى :تحديد المسار المعتمد لشبكة توزيع الكهرباء وخطوط الأنابيب والطرق التي ستخضع لإعادة التأهيل وإعادة الإعمار وتركيب الأسوار المحيطة بمنطقة العمل.
- تحديد منطقة تجميع النفايات/المخلفات المؤقتة
- سيتم نقل المعدات اللازمة لتفكيك الأعمدة أو الأسلاك أو الأنابيب أو المواد الأخرى المكسورة وكسر الأسفلت القديم إلى منطقة التخزين المؤقتة في الموقع.
- إزالة وتفكيك الأعمدة والأسلاك والكابلات والمحولات التالفة وأي تركيبات وأنابيب وأسفلت تالفة
- التخلص من العناصر التالفة بشكل مؤقت في منطقة تجميع النفايات/المخلفات في الموقع
- أخيراً التخلص من النفايات/المخلفات في أقرب موقع للمخلفات يتم تحديده بواسطة مقاول لديه رخصة.

د. مرحلة الإنشاءات

- **تأهيل شبكة توزيع الكهرباء إنارة مشروع التنمية الطارئ بالعراق – التمويل الإضافي**

شبكة التوزيع في المشروع عبارة عن دائرة تيار متردد هوائية ثلاثية التردد. ستحمل خطوط التوزيع الأولية طاقة جهد متوسط (11 كيلو فولت) إلى محولات توزيع مثبتة على أعمدة ، والتي ستعمل على تخفيض الجهد من 11 كيلو فولت إلى جهد الاستخدام 0.4 كيلوفولت. أما بالنسبة لشبكة إنارة الشوارع ، فالكابلات الكهربائية الهوائية كذلك.

تشمل أنشطة الإنشاءات الرئيسية ما يلي:

- إعداد مناطق تجميع النفايات المؤقتة ، ومرافق التخزين لمواد المشروع خلال مرحلة الإنشاءات.
- تحديد وإخلاء مسار الخط
- الحفر
- التنقيب
- إنشاء الأعمدة الأنبوبية
- طلاء أعمدة الإنارة باستخدام طلاء مناسب
- تثبيت أعمدة الإنارة باستخدام الأسلاك النحاسية مقاس 50 * 1 مم 2 وطول 150 سم
- تركيب القابلات ، والموصلات ، والعوازل ، والمحولات التي يتم تركيبها على عمود وجميع الملحقات والتجهيزات اللازمة.
- إصلاح إنارة الشوارع وشبكة تصريف مياه الأمطار وذلك تحت مشروع التنمية الطارئ في العراق – التمويل الإضافى W04-B

- **تطوير شبكة تجميع مياه الأمطار**

بعد تجميع مياه الأمطار بواسطة شبكة مياه المطر التي تم إعادة تأهيلها ، سيتم التخلص منها في الوديان الطبيعية القريبة من مناطق المشروع اعتمادًا على تضاريس الأرض.

تشمل أنشطة الإنشاءات الرئيسية ما يلي:

- أنشطة الحفر
- مد الأنابيب وتركيبها
- ردم وإصلاح الطرق
- اختبار التسرب
- إنشاء غرف التفتيش (المانهول)

- **إعادة تأهيل الطرق (مشروع التنمية الطارئ بالعراق التمويل الإضافي)**

يختلف عرض الطرق من 6 - 8 - 10 م عرضًا. وتتكون عملية رصف الطرق من عدة مستويات ، على النحو التالي:

- إعداد الموقع
- أعمال تسوية وتنظيم الأرض
- صب القاعدة
- القاعدة
- أعمال اللحام
- رصف المنطقة السطحية بالخرسان

هـ. المصادر

- مصادر المياه: مصدر المياه للاستخدام المنزلي (الشرب ، إعداد الطعام ، الصرف الصحي الشخصي ، أواني الغسيل) هو شبكة المياه العامة في المنطقة. الكمية المتوقعة من المياه للاستخدام المنزلي هي 50 لترًا للفرد في اليوم.
- الكهرباء: مصدر الكهرباء هو الشبكة القومية بالإضافة إلى المولدات التي سيوفرها المقاول لاستخدامها أثناء انقطاع التيار الكهربائي.
- الوقود: يجب على المقاول توفير جميع الوقود المطلوب من محطات الوقود المحلية.

4. وصف البيئة المحيطة

يمكن تصنيف المنطقة المحيطة بالمشروع على أنها منطقة حضرية. يوضح الجدول التالي المستقبلات الحساسة المحيطة بالمشروع ومسافاتها عن مناطق المشروع (غرب مدينة السماح وشرق مدينة السماح).

جدول رقم 1 : المستقبلات ذات الحساسية في مناطق مشروع شرق وغرب السماح

مستقبلات	غرب منطقة السماح	شرق منطقة السماح
نهر دجلة	6.1 كيلو متر	7.9 كيلو متر
مدرسة عدن	0.28 كيلو متر من الأنابيب 0.75 – كيلو متر s	1.72 كيلو متر
مركز أركان الصحي	0.325 كيلو متر	داخل منطقة المشروع
مدرسة البواسل	0.5 كيلو متر	0.74 كيلو متر

أقرب حديقة	0.65 كيلو متر	2.1 كيلو متر

أ. البيئة الطبيعية

المناخ[1]

يُصنف مناخ الموصل على أنه دافئ ومعتدل.وتعتبر أشهر الشتاء أكثر أمطارًا من أشهر الصيف في الموصل. يعتبر هذا المناخ حار جاف وفقًا لتصنيف مناخ كوبن – جيجر. متوسط درجة الحرارة في الموصل هو 19.8 درجة مئوية. تكون درجات الحرارة عند أعلى مستوى في يوليو / تموز عند حوالي 32.9 درجة مئوية. يناير / كانون الثاني هو أكثر الشهور برودة ، مع متوسط درجة الحرارة 7.2 درجة مئوية يبلغ متوسط هطول الأمطار 456 ملم.

جودة الهواء المحيط ومستوى الضوضاء

لا تتوفر حاليًا قياسات جودة الهواء المحيط ومستوى الضوضاء لمناطق المشروع المحددة.

جيولوجيا

يمكن تقسيم العراق إلى خمس مناطق فسيولوجية.

1. منطقة جبل زاغروس
2. منطقة التلال
3. المنطقة الصحراوية
4. منطقة الجزيرة
5. منطقة سهل بلاد ما بين النهرين

المياه الجوفية

لم يتم إجراء اختبارات للمياه الجوفية في مناطق المشروع. ومع ذلك ، وفقًا للدراسة الإطارية للمشروع ، لا توجد طبقات مياه جوفية محددة في المنطقة. لذلك ، من غير المتوقع أن يكون هناك تضارب بين أنشطة المشروع والخزان الجوفي. علاوة كما أنه تُظهر الخريطة الهيدروجيولوجية للعراق أن عمق المياه الجوفية في الموصل يتراوح بين 30–40 م.

المياه السطحية

يُعد نهر دجلة المياه السطحية الرئيسية في الموصل.

a. البيئة البيولوجية

[1] (https://en.climate-data.org/asia/iraq/nineveh/mosul-1248/)

النباتات والحيوانات

في مناطق عمل مشروع التنمية الطارئ بالعراق، لا يوجد أى أنواع نادرة أو مهددة بالانقراض من النباتات أو الحيوانات. وجميع الحيوانات والنباتات التى تم رصدها من الأنواع المنتشرة في العديد من المناطق. في الختام ، لا توجد موائل / أنظمة إيكولوجية كبيرة في مناطق المشروع يمكن أن تتأثر بأنشطة المشروع.

b. البيئة الإجتماعية

1. تعداد السكان

يبلغ إجمالي تعداد سكان محافظة نينوى الذى تم تضمينه في الدراسة الإستقصائية العنقودية المتعددة المؤشرات 2018 (MICS)الذي قام بإعداده الجهاز المركزي للإحصاء 3,729,998 شخصًا. بناءً على الاجتماع الذي تم إجراؤه مع الجهاز المركزي للإحصاء (CSO) ، يبلغ إجمالي عدد السكان في الجانب الأيسر حوالى 245,000 نسمة.

أما فيما يتعلق بالتركيبة السكانية ، تتميز منطقتي السماح وحى اليرموك في الجانب الأيسر من مدينة الموصل بتنوع السكان بشكل كبير، حيث يوجد مجموعات سكانية من العرب والأكراد والمسلمين والمسيحيين واليزيديين والشبك والكنية. ويبلغ العدد الإجمالي للأسر المعيشية في الجانب الأيسر حوالي 45,000 أسرة (بناءً على لقاء مع بلدية الموصل). في حين يبلغ متوسط حجم الأسرة المعيشية حوالي 5.44 فرد لكل أسرة في الجانب الأيسر من مدينة الموصل.

2. الخدمات الأساسية

تتسم الخدمات الأساسية في منطقتي السماح وحي اليرموك بالمحدودية من حيث الكم والنوع. بالإشارة إلى الاجتماع الذي تم إجراؤه مع منظمات المجتمع المدني والبيانات التى تم نشرها في الدراسة الإستقصائية العنقودية المتعددة المؤشرات ، أصبح من الواضح أن هناك نسبة من السكان يمكنهم الوصول إلى الخدمات الأساسية. يمكن استنتاجها على النحو التالي:

- **الحصول على الكهرباء**

يحصل جميع السكان المقيمين في السماح و حى اليرموك على الكهرباء كما أفادت بلدية الموصل ومنظمة المجتمع المدني. ومع ذلك ، تعاني شبكة الكهرباء في منطقتي السماح وحي اليرموك من انقطاع التيار الكهربائي المتكرر. كما أن شبكة الكهرباء في حالة سيئة للغاية.

- **المرافق الصحية**

هناك العديد من المرافق الصـــحية في مواقع المشـــروع وهى كافية لأفراد المجتمع. في عام 2018 ، أشـــار تقرير الدراســـة الاستقصـائية العنقودية المتعددة المؤشرات إلى أن إجمالي عدد المؤسسات الصحية في محافظة نينوى بلغ 317 مؤسسة ، 19 منها حكومية ، و 178 منها مخصصة كمرافق صحية أولية[2].

5. تقييم المخاطر والتأثيرات المحتملة

يتم عرض التأثيرات الرئيسية للمشروع خلال مرحلة ما قبل الإنشاءات والإنشاء والتشغيل في الجدول التالي:

[2] الدراسة الإستقصائية العنقودية متعددة المؤشرات

جدول رقم 2: ملخص التأثيرات السلبية للمشروع

المستقبلات والعناصر البيئية والإجتماعية	التأثيرات المحتملة	الإطار الزمنى	الإطار المكاني	شدة التأثير	مؤشر التأثير الأساسي	تصنيف المستقبلات	دلالة التأثير
تقييم التأثيرات أثناء مرحلتى ما قبل الإنشاءات والإنشاءات							
الضوضاء	الضوضاء والاهتزاز أثناء عملية إعداد الموقع والإنشاءات	**ضعيف جدا**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
جودة الهواء	الانبعاثات الغازية(SOx ، NOx، CO، VOCs، إلخ). • انبعاثات الغبار (PM10، PM2.5) بسبب أعمال الحفر	**ضعيف جدا**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
تولد النفايات والمواد الخطرة	قد ينتج عن إدارة وتخزين النفايات الخطرة وغير الخطرة بشكل غير سليم بعض التأثيرات البيئية السلبية	**ضعيف جدا**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
تلوث التربة	• إمكانية تلوث التربة / باطن الأرض بسبب الانسكابات العرضية • التصريف غير السليم للمياه الصرف المنزلية الناتجة عن مكاتب المخصصة لعمالة الإنشاءات	**ضعيف جدا**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
تآكل التربة	• • زيادة تآكل التربة في موقع المشروع بسبب أعمال الحفر ، خاصة خلال مواسم الأمطار	**ضعيف جدا**	**ضعيف**	**متوسط**	**ضعيف**	**متوسط**	**ضعيف**

المستقبلات والعناصر البيئية والإجتماعية	التأثيرات المحتملة	الإطار الزمنى	الإطار المكاني	شدة التأثير	مؤشر التأثير الأساسي	تصنيف المستقبلات	دلالة التأثير
مصادر المياه	**التلوث** • التخلص غير السليم من الحطام أو مخلفات البناء على ضفاف الأنهار • التصريف غير السليم لمياه الصرف الناتجة عن مكاتب العمال في المسطحات المائية • تلوث المياه الجوفية عن طريق إلقاء النفايات بشكل غير منضبط	**لا يوجد**	**لا يوجد**	**ضعيف جدا**	**ضعيف جدا**	**ضعيف**	**ليس له دلالة**
	استهلاك •زيادة استهلاك المياه لأغراض البناء • زيادة استهلاك المياه للاستخدام المنزلي من قبل العمال.	**ضعيف جدا**	**ضعيف**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**
إستهلاك الطاقة	• استهلاك الوقود الأحفوري (بشكل رئيسي الديزل) لمركبات البناء والمولدات.	**ضعيف جدا**	**ضعيف**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**
النباتات والحيوانات	• الأنواع النباتية والحيوانية غير مصنفة على أنها نادرة أو مهددة بالانقراض. • المشروع عبارة عن إعادة تأهيل لشبكة موجودة بالفعل ، لذا لا يُتوقع أن تدمر أنشطة المشروع الموائل الأرضية لأي نوع	**ضعيف جدا**	**ضعيف جدا**	**ضعيف جدا**	**ضعيف جدا**	**ضعيف**	**ليس له دلالة**
استخراج الموارد الطبيعية	• استخراج المواد الخام ، مثل الحصى والرمل من المحاجر له تأثير سلبي على توافر هذه الموارد الطبيعية	**ضعيف جدا**	**ضعيف**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**

المستقبلات والعناصر البيئية والإجتماعية	التأثيرات المحتملة	الإطار الزمنى	الإطار المكاني	شدة التأثير	مؤشر التأثير الأساسي	تصنيف المستقبلات	دلالة التأثير
الصحة والسلامة المهنية	• أنشطة لإنشاءات من بين الأنشطة الأكثر خطورة وتعرضًا للحوادث في أي بيئة عمل. التعرض لمخاطر موقع الإنشاءات يمكن أن يعرض العمال للإصابات.	**كبير جدا**	**متوسط**	**متوسط**	**كبير**	**متوسط**	**كبير**
صحة وسلامة المجتمع	• قد ينقل عمال المشروع الأمراض إلى المجتمعات المحلية. • قد تؤدي مركبات المشروع وأنشطة البناء إلى إصابات بين المشاة المجتمعيين الذين يستخدمون الشوارع. • الإضافة إلى ذلك ، قد يكون هناك انبعاثات غبار تؤثر على الأشخاص الذين يعانون من الحساسية	**كبير**	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
تدفق حركة المرور	• سيتأثر التدفق المروري بسبب إعادة تأهيل الشوارع وحركة المعدات ومواد البناء	**ضعيف جدا**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
عمالة الأطفال	• تميل عمالة الأطفال إلى الارتفاع حيث أن العراق سن مؤخراً القانون 2015/37 (قانون العمل العراقي). ينص الفصل 3 من هذا القانون على أن الحد الأدنى لسن العمل هو 15 سنة.	**كبير**	**متوسط**	**كبير**	**كبير**	**متوسط**	**كبير**
التأثيرات على المنظر الجمالي	• بالنسبة لأعمال الإنشاءات والحفر ، تكون التأثيرات على المنظر الجمالي مؤقتة ، بشكل رئيسي من التخزين الأرضي لمنتجات الحفر والمواد الخام (أكياس الأسمنت ، خلاطات الخرسانة ، نفايات البناء ، إلخ).	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**

المستقبلات والعناصر البيئية والإجتماعية	التأثيرات المحتملة	الإطار الزمنى	الإطار المكاني	شدة التأثير	مؤشر التأثير الأساسي	تصنيف المستقبلات	دلالة التأثير
التأثيرات الخاصة بالتراث الثقافي	العراق مشهورة بتاريخها الطويل. لذلك ، هناك دائمًا احتمال كبير للعثور على عناصر ذات قيمة ثقافية. بالإضافة إلى ذلك ، هناك عدد كبير من المساجد والمقابر أيضًا.	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**
البنية التحتية والمرافق	• قد يؤدي كسر مواسير المياه إلى قطع المياه عن عدد من الوحدات السكنية ، • يؤدي إتلاف مواسير الصرف الصحي وكابلات الكهرباء شبكات المياه إلى إزعاج شديد لأفراد المجتمع.	**متوسط**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**	**ضعيف**
تدفق العمالة بشكل مؤقت	• خطر التسبب في خلافات مع المجتمع • زيادة خطر السلوك غير المشروع والجريمة • خطر انتقال الأمراض المعدية • تسبب تضخم الأسعار	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
العنف القائم على النوع الإجتماعي	• هناك احتمال وجود تأثيرات تتعلق بالعنف القائم على النوع الإجتماعي ، مثل التحرش الجنسي والتمييز والحرمان من الفرص والإستبعاد الاقتصادي	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**

المستقبلات والعناصر البيئية والإجتماعية	التأثيرات المحتملة	الإطار الزمنى	الإطار المكاني	شدة التأثير	مؤشر التأثير الأساسي	تصنيف المستقبلات	دلالة التأثير
إستملاك الأراضى	• يقوم المقاول بتأجير الأراضي لتخزين مواد البناء • مناطق تخزين مؤقتة في الشارع. سيقوم المقاول باستئجار مناطق تخزين الموقع من أجل تخزين المعدات • لن تتضمن الأراضي المذكورة أعلاه على أى أنشطة لإعادة التوطين القسرى.	**ضعيف**	**ضعيف**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**
تقييم الآثار في مرحلة التشغيل							
الضوضاء	• الضوضاء بسبب أعمال الصيانة والإصلاح	**ضعيف جدا**	**ضعيف جدا**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**
	• زيادة مستوى الضوضاء والاهتزاز بسبب زيادة حركة المرور	**كبير**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
جودة الهواء	• زيادة في الانبعاثات الغازية.(SOx، NOx، CO ، المركبات العضوية المتطايرة ، الخ) بسبب زيادة في حركة المرور	**كبير**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
	• سوف يكون هناك إنبعاثات للغبار المتطاير (PM10، PM2) والانبعاثات الغازية(SOx و NOx و CO و VOCs وما إلى ذلك) أثناء أنشطة الصيانة	**ضعيف جدا**	**ضعيف جدا**	**ضعيف**	**ضعيف**	**ضعيف**	**ليس له دلالة**

المستقبلات والعناصر البيئية والإجتماعية	التأثيرات المحتملة	الإطار الزمنى	الإطار المكاني	شدة التأثير	مؤشر التأثير الأساسي	تصنيف المستقبلات	دلالة التأثير
تولد النفايات والمواد الخطرة	• يتم تولد النفايات خلال مرحلة التشغيل الناتجة عن أنشطة الصيانة والإصلاح والاستبدال	**ضعيف جدا**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
الصحة والسلامة المهنية	التأثيرات المتعلقة بالصحة والسلامة المهنية ذات أهمية متوسطة ، بسبب العدد المحدود من العمال وإجراءات الصحة والسلامة المهنية الصارمة.	**ضعيف**	**ضعيف**	**متوسط**	**متوسط**	**متوسط**	**متوسط**
صحة وسلامة المجتمع	خلال المرحلة التشغيلية ، سوف تصبح التأثيرات الخاصة بالصحة والسلامة المجتمعية محدودة بسبب محدودية الكثافة المرورية وغياب أي نوع من العمالة الوافدة.	**ضعيف جدا**	**ضعيف جدا**	**ضعيف**	**ضعيف**	**متوسط**	**ضعيف**
التأثيرات الخاصة بالمجال الكهرومغناطيسي (ينطبق فقط على شبكة توزيع الكهرباء الهوائية)	تولد شبكة التوزيع الهوائية المجالات الكهرومغناطيسية حول الموصلات ، وتتناسب شدة هذه الحقول مع جهد الخط والتيار الكهربائي الذي يتغير في القوة بمرور الوقت مع تقلب الطلب على الكهرباء.	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**	**متوسط**

6. خطة الإدارة والمتابعة والرصد البيئية والاجتماعية

الهدف من خطة الإدارة والمتابعة والرصد البيئية والاجتماعية (ESMMP) ، هو تحديد الإجراءات المطلوبة للحد من التأثيرات السلبية المحتملة أو القضاء عليها ولرصد تطبيق وأداء تدابير التخفيف. يناقش القسم 6 من هذا التقرير خطة الإدارة البيئية والاجتماعية (ESMMP) للمستقبلات المختلفة ، ويحدد الأدوار والمسؤوليات المتعلقة بتنفيذ ورصد عمليات التخفيف أثناء مرحلتي الإنشاءات والتشغيل للمشروع.

7. المشاركة المجتمعية

أ. ملخص أنشطة التشاور المجتمعي

فيما يلي ملخص لأنشطة التشاور:

- حرص جميع أعضاء المجتمع المحلي والهيئات الحكومية التي تم التشاور معهم على تنفيذ جميع أنشطة المشروع على الفور دون مزيد من التأخير حيث كانت أحوال الشوارع وظروف توصيلات الكهرباء في حالة متدهورة ؛
- أكد المعلمون على استعدادهم للعمل كقناة اتصال نشطة، تشارك المعلومات مع آباء الأطفال ؛
- يعتبر هذا المشروع من أهم المشاريع التي تستهدف النساء والأطفال الضعفاء. أعربت النساء عن مخاوفهن بشأن أطفالهن ، فقد ينزلقن ويسقطن في شوارع مدمرة أو موحلة ؛
- أبدى أفراد المجتمع استعدادهم للعمل في المشروع ، لأن معدل البطالة مرتفع ؛
- لا يُتوقع أن يكون لدى النساء فرص عمل في المشروع خلال مرحلة الإنشاءات ، لأن غالبية النساء في المجتمع المحلي لا يرغبن في العمل في مثل تلك المشروعات؛
- أفاد كلا من المواطنين والجهات المعنية بتأييدهم للمشروع إلى حد كبير لأنه سوف يعمل على تحسين وتطوير ظروف الشارع وسوف يقوم بإصلاح شبكة الكهرباء

ب. متطلبات ونطاق نشر نتائج خطة الإدارة البيئية والإجتماعية

بمجرد حصول خطة الإدارة البيئية والاجتماعية الخاصة بالموقع على موافقة من البنك الدولي وموافقة وزارة البيئة ، سيتم اتخاذ إجراءات نشر النتائج التالية:

- سيتم نشر تقرير نهائي باللغة الإنجليزية وملخص باللغة العربية على المواقع الإلكترونية لكل من البنك الدولي ومشروع التنمية الطارئ في العراق وفي ووزارة الكهرباء وبلدية الموصل.

- سيتم توفير نسخة من تقرير خطة الإدارة البيئية والاجتماعية باللغة الإنجليزية وملخص باللغة العربية في مكتب وزارة الكهرباء بمحافظة نينوى. بالإضافة إلى ذلك ، سيتم توفير ملخص تنفيذي عربي في الفرع الإقليمي وبلدية الموصل.
- سيتم تثبيت ملصق A3 في مدخل بلدية الموصل لإبلاغ نتائج خطة الإدارة البيئية والاجتماعية (ESMP) ورابط الموقع الإلكتروني الخاص بالدراسة الكاملة لخطة الإدارة البيئية والاجتماعية.(ESMP)
- سيكون من المفيد أيضًا الحفاظ على منشورات عن تأثيرات المشروع ، وآلية الشكاوى ومكتب الاتصال في الفرع الإقليمي.

1. INTRODUCTION

1.1 Project Background

The Emergency Operation for Development Project (EODP) is expanding its support to, Ninawa governorate. This ESMP establishes a framework for the identification of environmental and social potential impacts, mitigation, and monitoring measures to be taken during all phases of the following three components of the project (hereinafter referred to as the "Subproject") that take place in Al-Samah and Yarimcha districts in Mosul city located in Ninawa governorate:

- **EODP-AF-NIN-W04-A**: Rehabilitation and reconstruction of the overhead electricity distribution and street lighting networks in Al-Samah and Yarimcha districts.
- **EODP-AF-NIN-W04-B**: Rehabilitation of the storm water drainage network and streets rehabilitation in the east side of Al Samah district.
- **EODP-AF-NIN-W04-C**: Rehabilitation of the storm water drainage network and streets rehabilitation in the west side of Al Samah district.

The figure below shows a map of Ninawa governorate.

Figure 1-1: Ninawa Governorate

1.2 Rationale for the ESMP

The purpose of environmental and social management plan is to consider and develop proper measures and controls to decrease the potential for environmental degradation as well as provide clearly defined action plans to account for human and environmental health and safety

The key objectives of the ESMP are the following:

- Describe the Subproject's components and activities of relevance to the environmental and social assessments;
- Identify relevant national and international legal requirements and guidelines;
- Assess the baseline status of environmental and social conditions;
- Consider project alternatives
- Evaluate potential site-specific environmental and social impacts of the project;
- Develop environmental & social management and monitoring plans in compliance with the relevant national and international legislation;
- Establish the roles and responsibilities of all parties (institutional setting) involved in the project's environmental and social management;
- Document key environmental and social concerns raised by stakeholders during public consultation activities; and
- Ensure the existence of a grievance redressal mechanism (GRM) for the lodging and handling of complaints.

1.3 Scope of Work

The scope of the EODP consists of ten components, the proposed project in this study falls under component 10.

The World Bank Operational Policy 4.01 on Environmental Assessment was triggered as the proposed Subproject has some potential negative environmental and social impacts. Accordingly, this Environmental and Social Management Plan (ESMP) is required to implement the Sub-project in accordance with the requirements of the World Bank's Operational Procedures and applicable Iraqi national legislation. It provides an overview of the environmental and social baseline conditions of the area of influence, summarises the potential impacts associated with the proposed rehabilitation and improvement works, and sets out the management measures required to mitigate and monitor any potential negative impacts.

This document is guided by the available ESMF. The information drawn from the ESMF was supplemented by additional literature research, field data collection, as well as consultations and close collaboration with the institutional stakeholders and members of the local community. Therefore, the potential impacts and associated mitigation measures and management procedures presented in this ESMP are based on the baseline information and E&S assessments.

The ESMP is designed in such a way as to form a binding document to the contractors who will then hold the responsibility for integrating the ESMP in their daily work. However, the contractors as well as the Proponent are also required to monitor environmental and social parameters and

ensure the full adherence to the ESMP. Hence, the prepared monitoring plan provides information for periodic review to ensure that environmental and social protection is optimized in all project phases through early detection and effective remediation of unwanted environmental and social impacts.

The ESMP outlines the environmental and social management processes and procedures applicable to the sub-project. Accordingly, the structure of this document is as follows:

- Chapter Two: Institutional and Legal Framework
- Chapter Three: Project/Activities Description
- Chapter Four: Environmental and Social Baseline Conditions
- Chapter Five: Assessment of Potential Risk, Impacts, and Alternatives
- Chapter Six: Environmental and Social Management Plan
- Chapter Seven: Public Consultation and Participation including Grievance Section

2. INSTITUTIONAL AND LEGAL FRAMEWORK

2.1 Preface

This Chapter describes the legal and administrative framework for the proposed project. It lists the national laws and the international requirements pertinent to the project. The WB has defined 10 environmental and social safeguard policies that must be considered for its financed projects. The applicability of such policies to this project are overviewed and discussed in the subsequent sections.

In case of any discrepancy between the requirements of Iraqi legislations and the requirements of the WB, the stricter requirements will be applied. In the case that national requirements are non-existent for specific issues or pollutants, the WB requirements will be adopted.

2.2 National Policy, Legal, Regulatory and Administrative Frameworks

2.2.1 General Environmental Legislations

Law no. 27 for the year 2009: Protection and Improvement of Environment

The law aims at protecting and improving the environment through mitigating existing damages or damages likely to be caused. The Law necessitates the provision of the Environmental Impact Assessment (Article 18) for any new developmental project in the country. The Law addresses the issues of regulation of air pollution and noise reduction, protection of soils, biodiversity conservation, management of hazardous waste, protection of the environment from pollution resulting from exploration and extraction of oil and natural gas, and establishment of an environmental protection fund. Additionally, the law specifies the necessity of protection of water resources from pollution, and it regulates the discharge of effluents independently of their origin. Moreover, the law specifies the punitive measures for violation of the specified regulations.

Law no. 37 for the year 2008: The Ministry of Environment

This Law was legislated to define the institutional arrangements of the Ministry of Environment. It outlines policies, and roles and responsibilities towards protecting the environment.

2.2.2 Applicable Environmental and Social Legislations to the Project

2.2.2.1 Air Quality

Regulation no. 4 of the year 2012: Ambient Air Quality

This regulation aims to protect ambient air quality and to control sources of pollution. The regulation necessitates that sources emitting air pollutants abide by national limits and use monitoring equipment to ensure compliance with standards. It also prohibits the burning of all types of wastes indoors or in open air, or next to a residential region or near water bodies.

2.2.2.2 Noise

Law no. 41 of the year 2015: Noise Protection and Control

This Law identifies maximum permissible noise limits during day and nighttime for the industrial, commercial and industrial zones as follows:

Table 2-1: Noise Limits for Different Working Zones

Industrial	70	65
Commercial	65	60
Residential	55	45

2.2.2.3 Water Resources

Law no. 50 of the year 2008:

The Law provisions for establishing the Ministry of Water Resources and creating the legal and technical framework for institutionalization of water resources management in the country.

Law no. 89 of the year 1981, amended by Decree No.54 of 2001: Public Health:

In addition to addressing various issues related to the population's health, the Law stipulates the provision of the safety of drinking water and drinking water quality standards.

Law no. 2 of the year 2001: Water Systems Protection

2.2.2.4 Chapter 4 of the law provides instructions on disposal or recycling of wastewater. It also prohibits the discharge of effluent into public water, unless it meets the criteria and specifications set out by the Environment Protection and Improvement Directorate (EPID). Waste Management

Instructions no. 2 of 2014 on Environmental Protection from Municipal Waste:

The instruction aims at protecting the urban environment with a proper management of wastes, such as solid materials, recyclable and non-recyclable, derived from domestic, commercial and professional activities, from the cleaning of streets, gardens, farms and public places, and construction waste.

Directive No. (67) of 1986 Regulating the Debris Collection Areas: debris disposal should be done in areas with stable geology and avoid sitting near particularly vulnerable or sensitive ecosystems and groundwater and surface water resources.

2.2.2.5 Occupational Health and Safety

Law No. 6 of 1988 concerning the National Commission for Occupational Hygiene and Safety

This Law governs the enforcement of occupational health and safety regulations. Provides for inspections of places of employment and inspections reports. Establishes the duties and responsibilities of employers vis-a-vis occupational health and safety. Establishes the functions of safety commissions at places of work. Regulates the responsibilities and duties of workers with respect to occupational health and safety.

Instructions No. 12 of 2016 on Occupational Health and Safety Requirements.

These instructions provide guidance on the Occupational Health and Safety procedures to be adopted.

- Provides for the enforcement of occupational health and safety provisions at places of work.
- Establishes the functions and duties of employers and employees with regard to occupational health and safety.

Directive No. 4 of 1993 concerning Occupational health, Protection of Workers against Vibration, Pursuant to Sections 3 and 105 of the Public Health Act (No. 89 of 1981)

It establishes work place procedures designed to minimize vibration and any harmful effects that workers might be exposed to. It also stipulates the maximum total daily limits for occupational exposure to vibration.

2.2.2.6 Labor Laws

Iraq recently enacted Law 37/2015 (the Iraqi Labor Law), which governs employment relationships in most of Iraq. To date, no known reforms are being considered for Iraq. In addition to this law, the respective government ministries may issue instructions or regulations that affect employment law. The law covers all aspects of employment, including:

- the definition of 'workers';
- hiring and termination;
- health and safety;
- leave;
- wages;
- collective bargaining; and
- Avenues for complaints and redress.

The law distinguishes foreign workers from Iraqi workers, but all workers must be fully documented in order to legally work in Iraq. The Iraqi Labor Law does not distinguish between employees and contractors. The law applies to all 'workers', which is anyone working under the supervision of an employer in return for a wage. The law does distinguish between permanent work and work for a defined period, but there are certain requirements that must be met under the law in order to ensure that a contract for a determined period does not convert to a permanent contract.

Furthermore, in regard to child labor, Article 6, Chapter 3 of Iraqi Labor Law, states that the minimum age for employment is 15 years old. However, Iraq is also signatory to the 1989 International Convention on the Rights of the Child, which defines everyone under the age of 18 as a child who must have special protection and care.

2.3 Relevant International Conventions and Treaties

The following lists the international conventions and treaties that have been signed and ratified by the Iraqi Government.

- UN Convention for Biological Diversity (UNCBD);

- UN Convention to Combat Desertification (UNCCD);
- RAMSAR Convention on Wetlands;
- UNESCO World Heritage Convention;
- United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol.
- ILO labor conventions

2.4 World Bank Safeguard Policies

The World Bank (WB) has identified 10 environmental and social safeguard policies that should be considered in its financed projects. The proposed project is classified as Category B according to the World Bank. This mandates an Environmental and Social Management Plan (ESMP).

Table 2-2: World Bank safeguard operational policies and their applicability to the project

Safeguard Policy	Triggered for EODP-AF	Applicability to Sub-project	Justifications
Environmental Assessment (OP/BP 4.01)	Yes	Yes	The project is classified as Category B which requires an Environmental and Social Management Plan (ESMP).
Natural Habitats (OP/BP 4.04)	No	No	Location and alignment of project components is mainly along (or close to) previously paved paths. Protected Areas, if encountered, will be avoided.
Forests (OP/BP 4.36)	No	No	Proposed subproject areas contain no forests.
Pest Management (OP 4.09)	Yes	No	The proposed subproject will not involve purchasing or using Pesticides.
Physical Cultural Resources (OP/BP 4.11)	Yes	No	This OP does not apply to Al-Samah and Yarimcha subprojects, but if these opportunities occur, cultural property management plans will be prepared for the subprojects
Indigenous Peoples(OP/BP 4.10)	No	No	No indigenous people are identified in Iraq.
Involuntary Resettlement (OP/BP 4.12)	Yes	No	No involuntary resettlement activities are anticipated for the proposed subproject.
Safety of Dams (OP/BP 4.37)	No	No	Not relevant to the proposed subproject
Projects on International Waterways (OP/BP 7.50)	Yes	No	Not relevant to the proposed subproject

Safeguard Policy	Triggered for EODP-AF	Applicability to Sub-project	Justifications
Projects in Disputed Areas (OP/BP 7.60)	No	No	Not relevant to the proposed subproject

2.4.1 OP 4.01 – Environmental Assessment

According to the World Bank Operational Policy OP 4.01, the project is classified among the projects that are likely to have potential, limited adverse environmental and social impacts for which the development of a full-scale ESIA is not required. The proposed project will not have significant adverse environmental impacts that are sensitive[3], diverse, or unprecedented. Environmental impacts of the project shall be analyzed and mitigation measures proposed for expected negative impacts, along with an Environmental Management and Monitoring Plan.

2.4.2 World Bank Policy- Access to Information

This Policy governs the public accessibility of information in the Bank's possession. The World Bank allows access to any information in its possession that is not on a list of exceptions.

This Policy is based on five principles:

• Maximizing access to information;

• Setting out a clear list of exceptions;

• Safeguarding the deliberative process;

• Providing clear procedures for making information available; and

• Recognizing requesters' right to an appeals process.

3. PROJECT DESCRIPTION

3.1 Overview

The proposed project addressed in the ESMP at hand is composed of three sub-projects;

- **EODP-AF-NIN-W04-A**: Rehabilitation and reconstruction of the overhead electricity distribution and street lighting networks in Al-Samah and Yarimcha districts.
- **EODP-AF-NIN-W04-B**: Storm water drainage network and road rehabilitation in the east side of Al-Samah district.
- **EODP-AF-NIN-W04-C**: Storm water drainage network and road rehabilitation in the west side of Al-Samah district.

The project description chapter addresses the project through three phases; pre-construction phase, construction phase and the operation phase.

3.2 Project Duration

The three sub-projects are expected to begin on March 2020 and end by the end of September 2020.

3.3 Project Location

Al-Samah and Yarimcha districts are located on the left bank of Mosul city. Mosul is a major city northern Iraq, located approximately 400 km north of Baghdad, in Ninawa governorate. Mosul stands on the west bank of the Tigris, as shown in Figure 3-1.

Figure 3-1 Map Of Iraq, showing the location of Mosul city in Ninawa governorate

- **EODP-AF-NIN-W04-A**: Figure 3-2 and Figure 3-3 show the routes of the electricity distribution networks in the project areas.

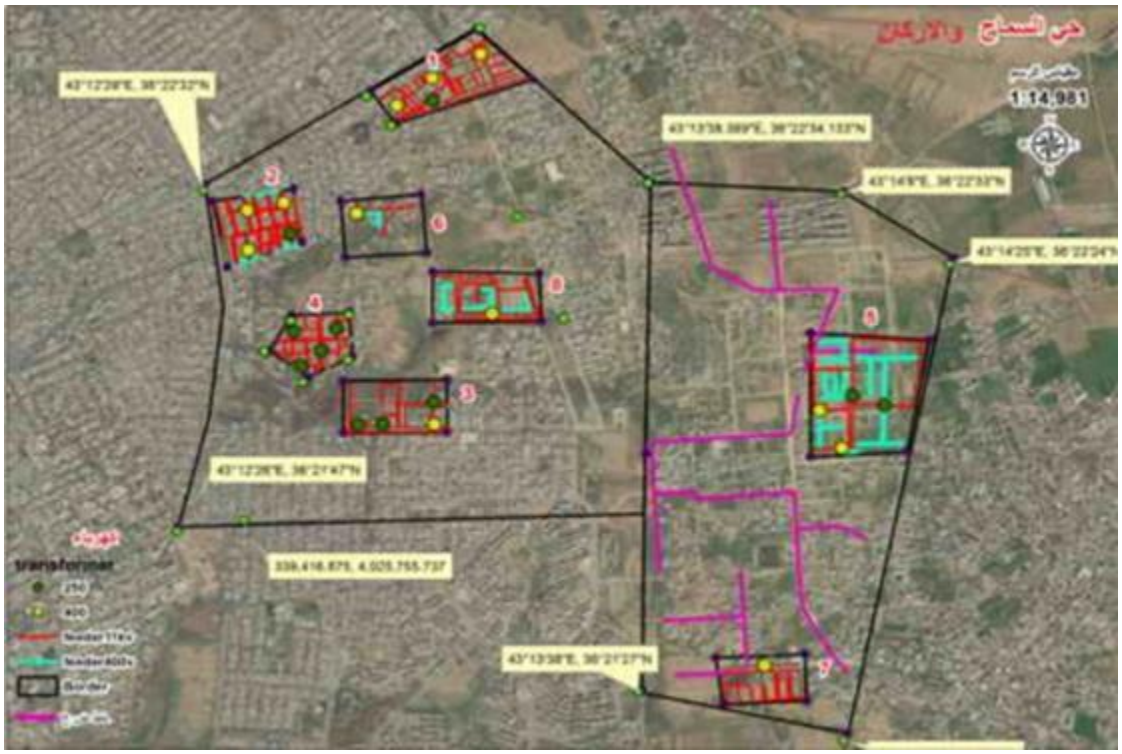


Figure 3-2 Electricity Distribution Network Route in Al-Samah District

Figure 3-3 Electricity Distribution Network in Yarimcha District

- **EODP-AF-NIN-W04-B**

The project includes a storm water drain network and streets rehabilitation on the east side of Al-Samah district, see Figure 3-4 and Figure 3-5.

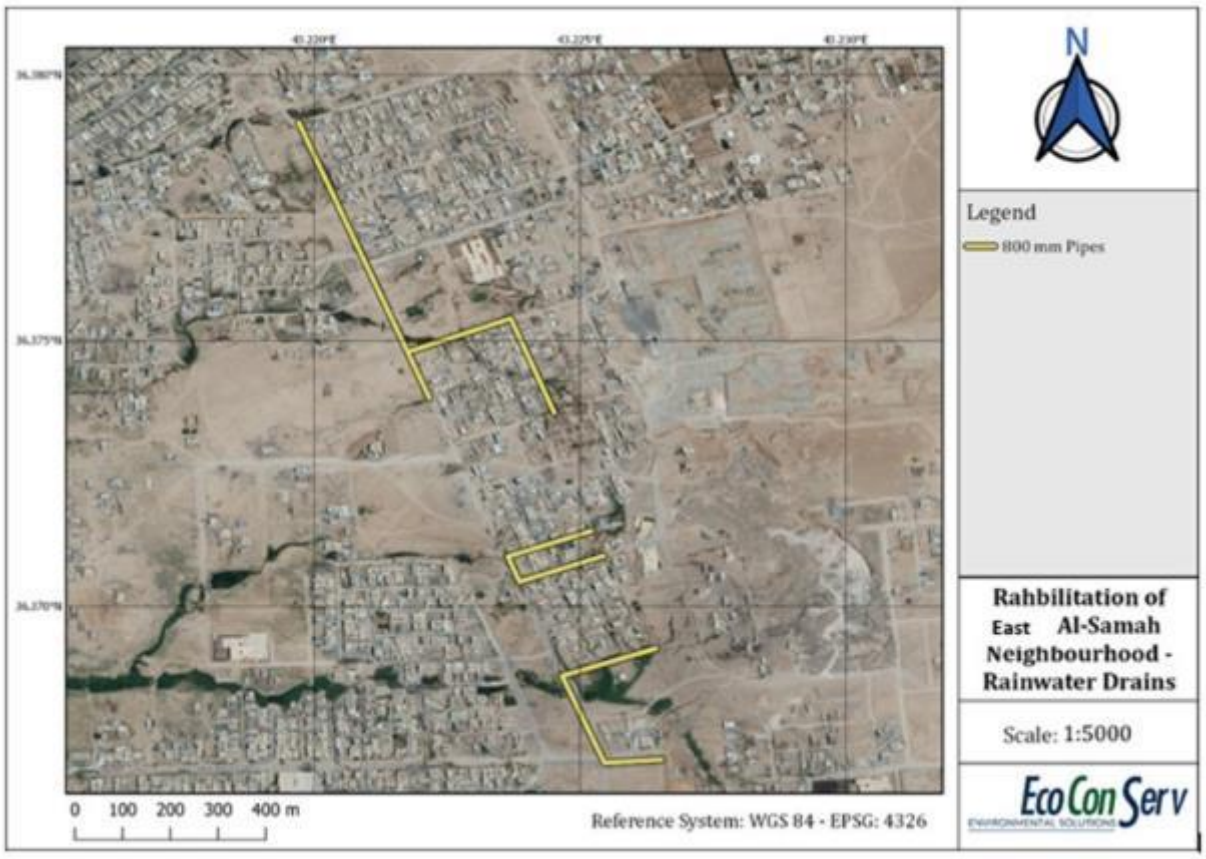


Figure 3-4 Storm Water Drainage Network in East Al-Samah

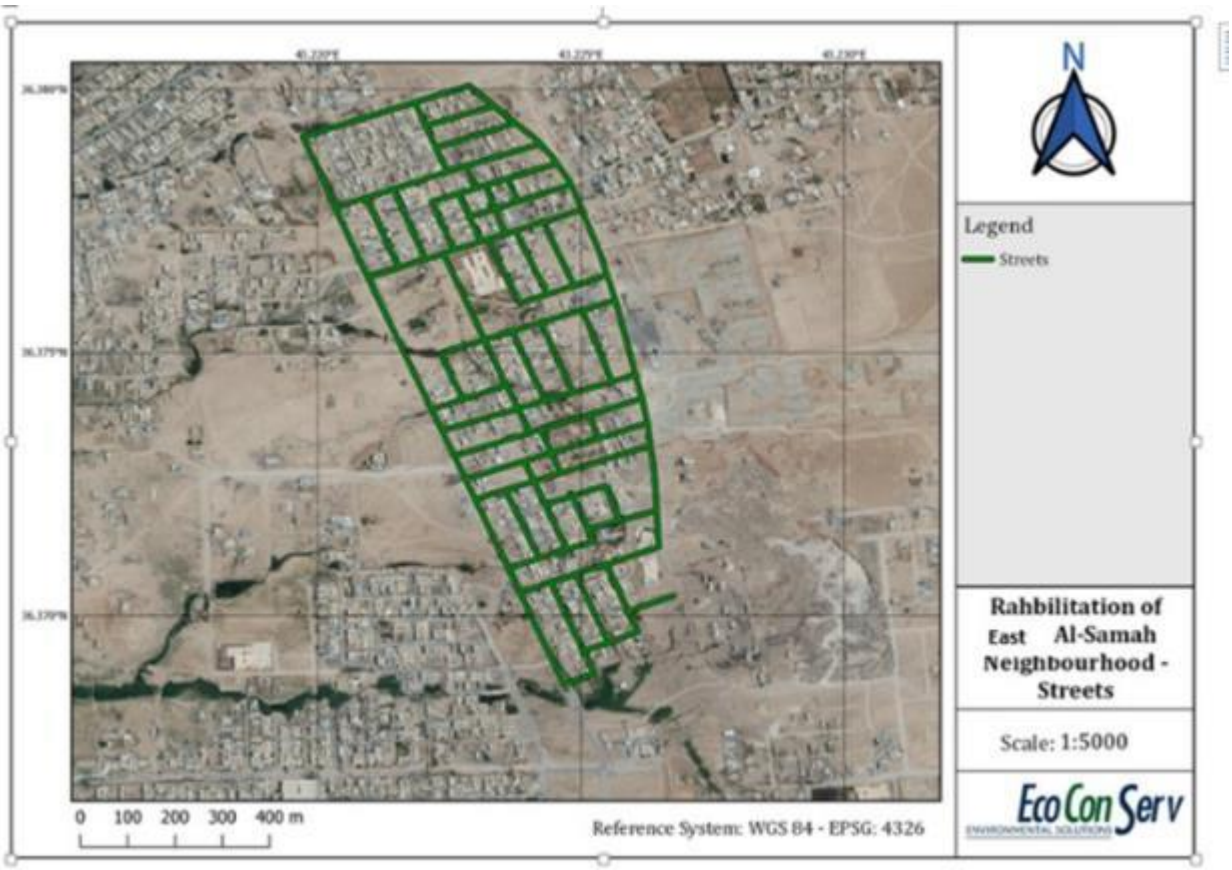


Figure 3-5 Streets Rehabilitation in East Al-Samah

- **EODP-AF-NIN-W04-C**

The project also includes a storm water drain network and streets rehabilitation on the west side of Al-Samah district, see Figure 3-6 and Figure 3-7.

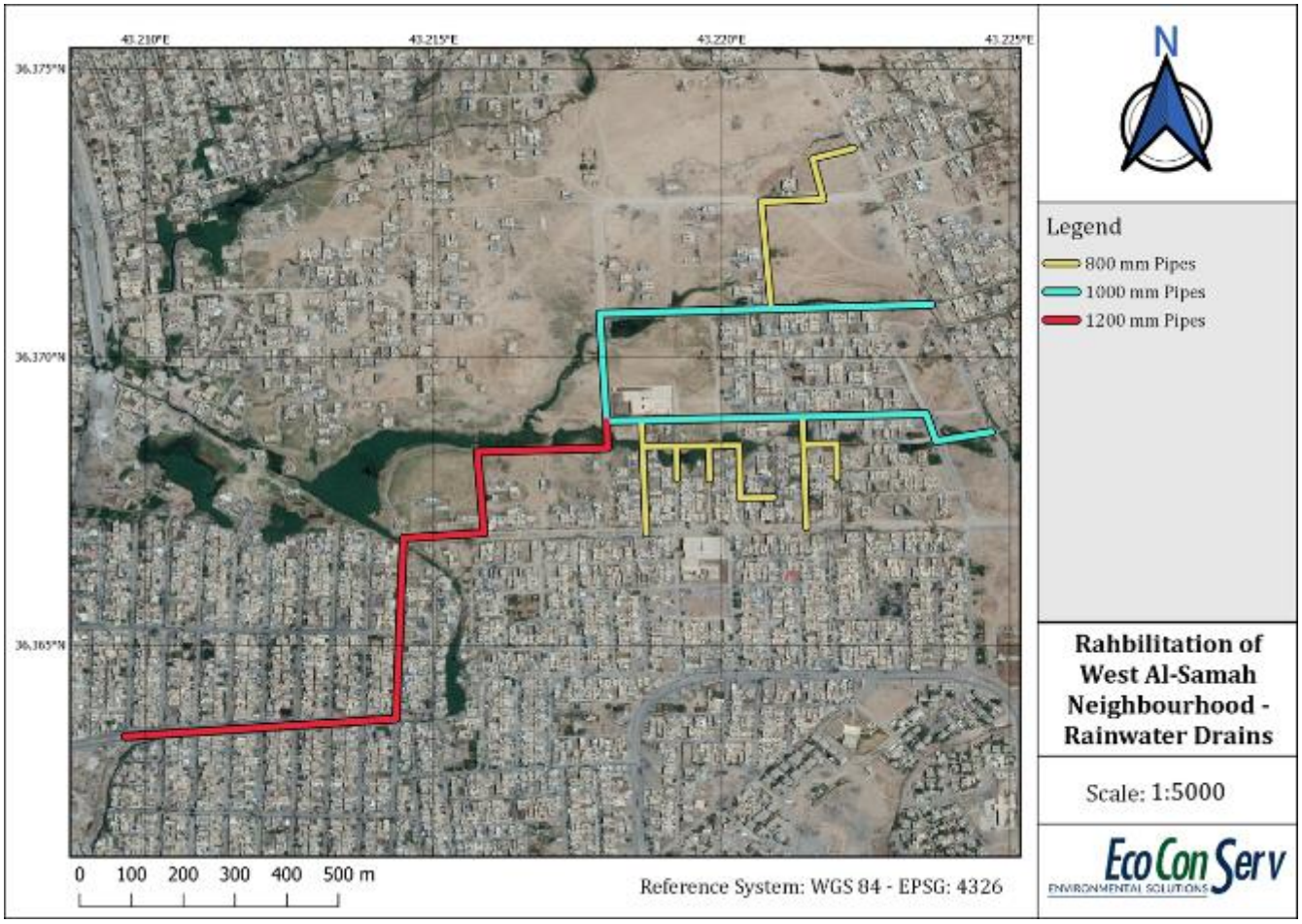


Figure 3-6 Storm Water Drainage Network in West Al-Samah

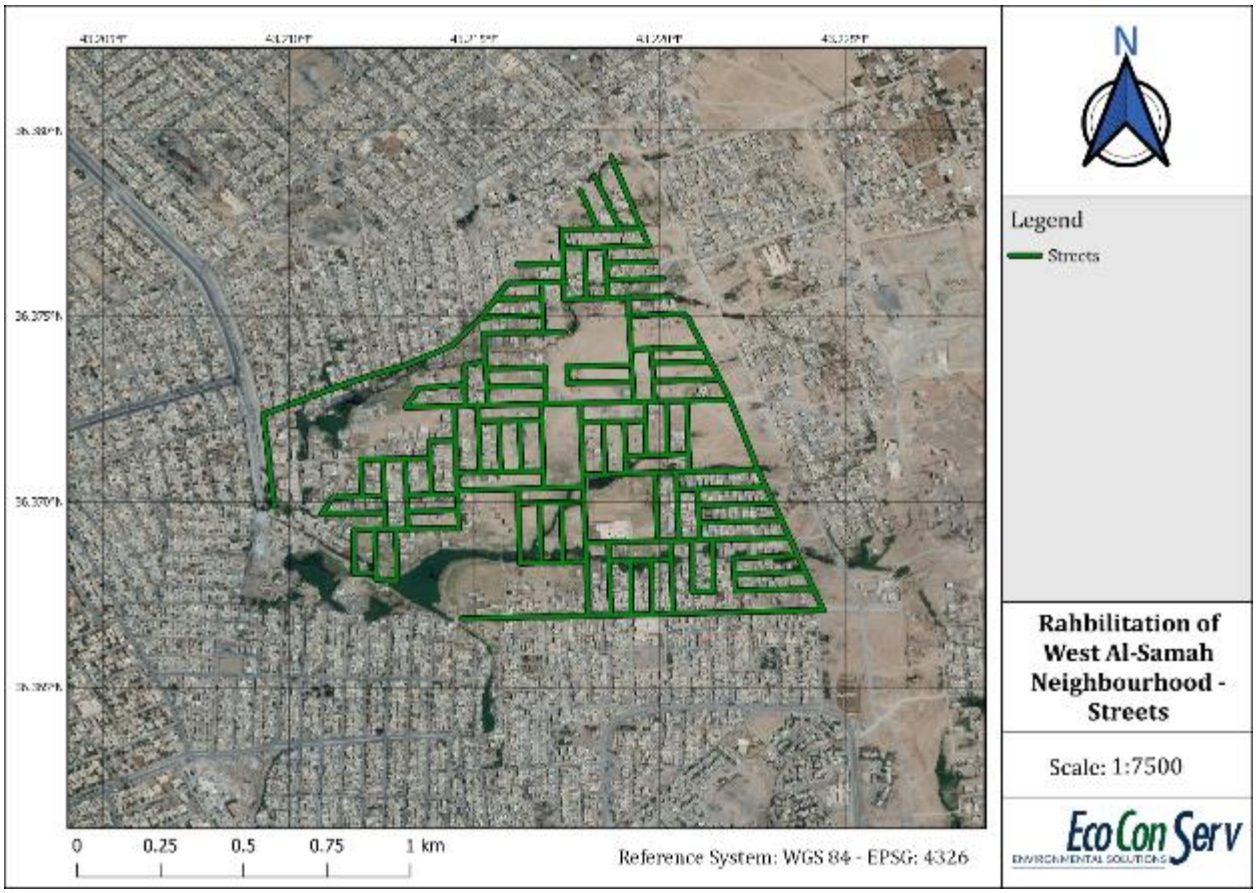


Figure 3-7 Streets Rehabilitation in West Al-Samah

3.4 Current Status of the Project Areas

The infrastructure and services in Al-Samah and Yarimcha were fully/partially destructed, such as the electricity distribution networks, streets lightings, streets paving, curbs, storm water drains, water networks, local people's houses, governorate's offices, etc. Figure 3-8 shows the current status in the areas of the project.

Regarding UXO, the Civil Defense investigated the projects areas and issued a clearance letter on 9-February-2020 (Annex I). However, in case of any accidental discoveries, the personnel should be immediately evacuated and armed forces contacted. The works could be resumed only after removal of the munitions.

Figure 3-8 The Current Status of the Project Areas

3.5 Project Categorization

Based on the World Bank safeguards policies, the project is classified as Category B and a specific ESMP is required for assessing the potential environmental and social impacts of the project and proposing the optimum mitigation measures. The electricity distribution network will be constructed in the same route of the old damaged network. There are no special habitats or flora and fauna; however, the land use is mainly residential. Therefore, the study is addressing all the potential social and environmental impacts, giving special attention to the community health and safety.

3.6 Pre-construction Phase

Pre-construction activities include:

- The first step is marking the approved route of the electricity distribution network, pipelines, and the roads that will be subject to rehabilitation and reconstruction and to install fences surrounding the work area
- Setting a temporary, on-site, waste accumulation area (WAA)
- Equipment necessary for the dismantling of broken poles, wires, pipes or other items and for the breaking of old asphalt will be transported to the temporary storage area on site.
- Removal and dismantling of damaged poles, wires, cables, transformers, any damaged fitting, pipes, and asphalt
- Disposing the damaged items temporarily in the waste accumulation area (WAA) on site
- Finally disposing the waste in the nearest designated waste facility by a licensed contractor

3.7 Construction and Operation Phases

3.7.1 Electricity Distribution Network and Street Lighting Rehabilitation- EODP-AF-NIN-W04-A

3.7.1.1 Overview

The distribution network in the project is an overhead 3-phase AC circuit. The primary distribution lines will carry medium voltage power (11KV) to distribution transformers, which are fixed on the distribution poles in the case of Al-Samah and Yarimcha distribution network. The distribution transformers then step down the voltage from 11Kv to the utilization voltage for lighting and household appliances; 0.4KV. As for the street lighting network, the electricity cables are overhead as well.

3.7.1.2 Main Components

- **Poles**

Two types of poles are used in the project; galvanized steel lattice poles and galvanized steel tubular poles.

Lattice Galvanized Steel Poles

Lattice galvanized steel poles 11m and 9m high are used in the project. According to the Technical Specification of Lattice Steel Poles (D46),by the Ministry of Electricity- Power Distribution Office-Baghdad, Iraq, lattice poles are made of hot rolled I- joists and angle-steel sections with steel plates

according to the specifications of JIS-G-3101 (STK-51) or in accordance with BS 4360 (Steel 52) or in DIN 17100, see **Error! Reference source not found.**.

Figure 3-9 Lattice Steel Pole

Tubular Galvanized Steel Pole

Featuring a streamlined, aesthetic shape, this structure is less massive and uses less space than other towers, allowing it to blend easily into the environment. Therefore, it's suitable for urban areas and commonly used[4], Figure 3-10.

ed-1.pdf

[4] EODP (P155732) and EODP-AF (P161515) Updated ESMF, (2017)

[4] EODP (P155732) and EODP-AF (P161515) Updated ESMF, (2017)

[4] (http://www.hydroquebec.com/learning/transport/t[4] Multiple Indicator Cluster Survey, 2018 (MICS) developed by the Central Statistical Organization (CSO)

ypes-pylones.html)

Figure 3-10 Tubular Steel Pole

Earth Wire

Its purpose is to protect the distribution wires and conductors from lightning discharges, as shown in Figure 3-11.

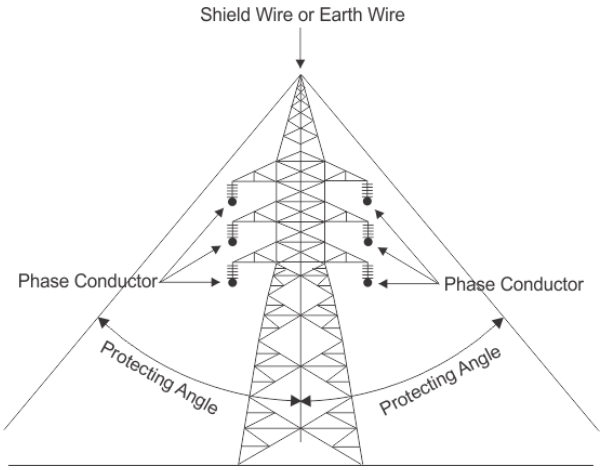


Figure 3-11 Earth Wire Fixed at the Top of the Tower and Creates a Protection Angle Around the Distribution Lines

Insulators

There are two types of insulators utilized in the project; pin type and disc insulator, see Figure 3-12.

Pin type Insulator

Disc Insulator

Figure 3-12 Pin Type and Disc Insulators

Cross Arms and Clamps

Cross arms and clamps hold the insulator to the pole structure, as shown in **Error! Reference s ource not found.**.

Transformers

The transformers used in the project are pole mounted 400 kVA, it steps down the voltage from 11 kV to 0.4 kV. Figure 3-13 shows pole mounted transformers.

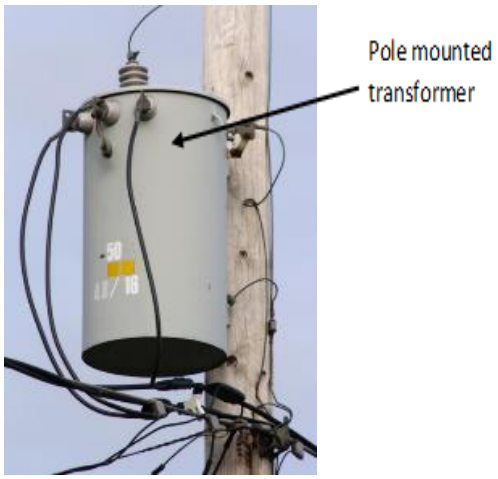


Figure 3-13 Pole Mounted Transformers

Conductors

The conductors used in the distribution lines of the project are All Aluminum Conductors (AAC) and Copper- Aluminum Conductors, see Figure 3-14.

Figure 3-14 AAC Conductor

Table 3-1 summarizes most of the components of the project as listed in the Bill of Quantities (BOQ).

Table 3-1 Components of the Overhead Electricity Distribution Network and Street Lighting and Relative Quantities Based on the BOQ

Component	Quantity	Unit
HV galvanized steel lattice poles, 11m high	268	No.
HV galvanized steel tubular poles, 11m high	497	No.
LV galvanized steel lattice poles, 9m high	350	No.
LV galvanized steel tubular poles, 9m high	870	No.
Aluminum wire 120 mm	55,000	m
Overhead cable 3*120+95+16 mm^2	40,000	m
Overhead cable 3*95+70+16 mm^2	55,000	m
Pulling clamp	1,600	No.
Suspension clamp	2,725	No.
Transformer (11/0.4 KV), capacity 400 KVA	95	No.
Circuit breaker 400amp	190	No.
11 kV pin type insulator	1,575	No.
11 KV disc insulator	850	No.
Conductor aluminum- aluminum	7,500	No.
Conductor aluminum-copper	6,000	No.

Component	Quantity	Unit
LV copper cable 150*1 mm²	10,150	m
LV copper cable 95*1 mm²	3,600	m
Lighting fixtures 125 W, including the lamp and the cell with wire 2.5*2 mm² and 1.5m long	2,015	No.

3.7.1.3 Construction Activities

1. Construction of temporary waste accumulation areas (WAA) for the generated waste, and storage facilities for project materials during the construction phase.
2. Identifying and clearing the right-of-way (RoW). As stated before, the electric distribution lines will be erected on the same route of the old damaged lines and all the damaged components will be replaced and reconstructed.
3. Manual excavation for the foundation of the poles. The size of the excavation pit for the lattice pole is 180*80*80 cm; whereas for the tubular pole is 180*60*60 cm.
4. Erecting the lattice and tubular poles, as shown in Figure 3-15, and pouring the foundations using sulphates resistant cement and molds of 30cm height.

Figure 3-15 Erecting Lattice and Tubular Steel Poles in Previuos Projects in Mosul, Iraq

5. Painting the poles using a suitable paint
6. Earthing the poles using copper wires of size 50*1 mm2 and length 150cm
7. Installing cables, conductors, insulators, pole mounted transformers and all the necessary accessories and fittings.

8. Fixing the street lightings
9. Decommissioning the construction offices and camps
10. Disposing all wastes in the temporary waste accumulation area, which is preferably allocated on-site, and then finally collected and disposed in the designated waste facility by a licensed contractor when the construction phase is over

3.7.1.4 Operation Activities

- The operation of the 11kV and 0.4kV lines is fully automated.
- Maintenance of the line will be done routinely every year or as deemed necessary by the system operator.
- The activities will include line clearance along the RoW,
- Repairing or replacement of damaged structures, conductors and cracked or broken insulators.
- The maintenance would also include weeding around poles for a radius of 1m to protect the poles from bush fires and creeping vegetation.
- Emergency maintenance will also be carried out in the case of technical breakdowns due to faults in the system after severe wind and weather conditions, and replacement of damaged poles, conductors and insulators will be carried out, as necessary.

3.7.2 Storm water Drainage Network- EODP-AF-NIN-W04-B and C

3.7.2.1 Overview

After collection of the storm water by the rehabilitated drainage network, it is going to be disposed in the natural valleys that are close to the project areas depending on the land topography

3.7.2.2 Construction Activities

Site Preparation and Pipes Transportation and Storage

- Clean the work site from any rubbish and debris.
- Equipment and piping will be transported to the site (temporary storage area).
- Quality control procedures during the transportation and handling of pipes should take place to ensure protection from any effects that may damage the pipes, and to prevent any traffic accidents.
- Before any excavation activities, the contractor shall coordinate with the different authorities to determine the existing infrastructure in the project's area (e.g. water lines, sewage lines, electrical cables and telecommunication lines) so as to avoid any undue damage. In case of lacking sufficient information on the available infrastructure, they will carefully excavate trial pits.

Excavation

- Carrying out the excavation work for a width of 1.2 m and with a variant depth that reach 5m, and according to the required slope. The expected volume of excavation is 8300m3 and 22,700m3 for W04-B and C, respectively
- Supporting excavation sides using bricks
- Extraction of groundwater under the excavation level
- Collecting and temporarily disposing the debris and construction waste in the WAA to be ultimately disposed in the nearest designated waste facility by the Mosul Municipality.

Pipe laying and Fixing

- Before pipe laying, the bottom of the trench is cleaned of any rocks or solid objects which may damage the pipes.
- Laying and fixing GRP pipes (glass fibre reinforced plastics) of strength 10000 N/mm3 and pressure 6 bar, with the following pipe diameters and lengths for W04 –B and C:
    - W04-B: 800mm-total pipe length 1,830m.
    - W04-C:1200mm-total length 1,265m; 1000mm-total length 1,340m; 800mm-total length 1,450m

Figure 3-16 GRP Pipes

- Laying and fixing UPVC pipes with diameter 315 mm. Total pipe length is 420m and 945m for W04-B and C, respectively.

Figure 3-17 UPVC Pipes

Backfill and Road Repair

- After laying and welding works, the trench containing the pipes is backfilled with sand either by a front loader or manually. The trench will be backfilled immediately after the pipeline has been laid considering that the finished backfilling level will be the same as the road level. The initial backfill will be to a height 20 cm of fine sieved sand to protect the pipeline. The backfill will be then compacted by wet sand layers of 25 cm. The pipes are surrounded by sand in order to absorb loads from the roads.
- The sand is effectively compacted in the trench in order to avoid road settlements, and subsequent cracks.

Leakage Testing

- Following construction activities, the piping should be tested to locate possible leaks.

Manholes

- For W04-B and W04-C, carrying out concrete work for manholes of internal dimensions 1.6*1.6 m and of bottom thickness at least 30cm and walls thickness at least 25cm, reinforcement steel of 16 mm diameter is used on each side. The cover thickness is 30cm and the manhole depth is in the range of 1.7-5.8 m
- W04-C: the preceding step is repeated for manholes of internal dimensions 1.8*1.8m and 2*2m

3.7.2.3 Operation and Maintenance[5]

The impairment of individual components of the drain system can compromise the functionality of the larger system. Generally, the frequency at which storm water drainage network components should be inspected depends on the age of the asset, the type and its location (near a water body, for example). Drainage systems are subject to functional impairment by a variety of conditions, including:

- Cracks and/or joint separation
- Corrosion
- Scour, undermining or erosion at the inlet or outlet
- Obstruction due to vegetation, debris, or other objects
- Capacity reduction due to excessive sediment accumulation
- Site specific conditions

Inspection and Maintenance Activities

- If any component is not functioning properly, the cause must be determined and the component be restored to working order as soon as practicable.
- Inspection shall be carried out after a storm event (post-storm).

[5] Stormwater Operations & Maintenance Plan, Nevada Department of Transportation, August 2017

- Inspections should occur before the winter season prior to any runoff event to ensure the drain system is in good functioning condition.
- Maintenance includes emergency repairs as a result of accidents, weather conditions or other unexpected damage
- Routine/preventive maintenance include:

Trash and Debris Removal

Trash should be removed on a routine basis as part of maintenance activities from the area surrounding the drain network to reduce the potential for clogging during storm events.

Mechanical/Structural Component Maintenance

Mechanical and structural components need to be maintained regularly in accordance with manufacturer's or design recommendations to ensure that they remain functional at all times. Valves, sluice gates, pumps, filters, cartridges, fences, gates, trash racks, and access hatches or locks should be operated during each inspection to ensure that they function properly.

Sediment Removal

Sediment that has accumulated that is affecting the function of the storm water control must be removed. In general, sediment should be removed when it exceeds 50% of storage capacity or the original design sediment storage depth. The sediment removed must be transferred to an appropriate facility for dewatering or disposal.

Mechanical/Structural Repair

Mechanical and structural repairs to the different components of the drain system should be made promptly. Equipment, materials, and personnel should be readily available to perform repairs on short notice. Conditions that could lead to structural failure and may necessitate an emergency repair include settling, scouring, cracking or seepage around outflow pipes.

3.7.2.4 Rainwater Harvesting

Instead of disposing the storm water without making use of it, a storm water harvesting system can be implemented in order to store the rain water for future use. The system will require a storage facility.

The amount, timing and variability of rain which occurs during a season or year are the key factors that must be evaluated in designing a water harvesting system. In arid lands, at least 15 to 20 years of record are needed. Mean annual rainfall is not a very good indicator of available water. Regardless of the design, there will be risk involved due to the uncertainty of rainfall. The user

must decide the amount of risk that can be accepted in case of insufficient rainfall during some periods[6].

3.7.3 Roads Rehabilitation-EODP-AF-NIN-W04-B and C

3.7.3.1 Construction Activities

Roads widths vary from 6, 8 and 10m wide. Roads paving consists of the construction and preparation of several layers, as follows:

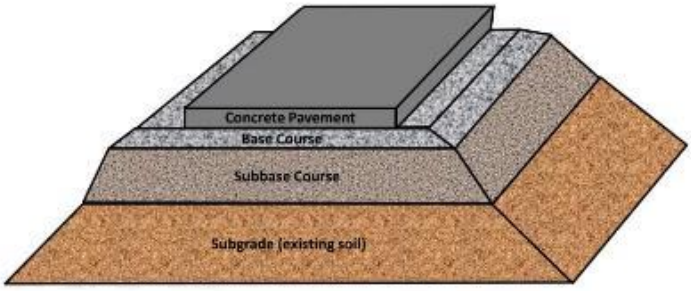


Figure 3-18 Layers of Roads Pavement

Site preparation

- The first step of construction includes marking the areas of work, installing fences around them and clean the work site from any rubbish.
- Equipment and materials will be transported to the site and kept in the temporary storage area. The coarse gravel and sand will be sourced from quarries that are officially licensed by Mosul municipality and the relevant governmental entities.

Subgrade and Earth Levelling

- Carrying out the necessary construction surveying work
- Cutting and filling with layers of clean soil according to the specifications (R5) of the General Conditions of Roads and Bridges
- Spraying and compacting the soil up to 95% compaction, taking into consideration the necessary slope for water drainage and a side slope of 2-6% for areas of 120,000m2 and 168,000m2 for W04-B and C, respectively.
- Prior to construction of the sub-base course, the subgrade shall be cleaned of all foreign substances, freed from mud and slurry and properly shaped and compacted by rolling to an even and uniform surface
- The work includes the removal of debris and disposing it in the designated waste facility by a licensed contractor.

[6] 3.11 Water harvesting, JOHN L. THAMES (http://www.fao.org/3/T0115E0l.htm).

Subbase

- Spreading a subbase layer of coarse gravel with a thickness of 20cm for an area of 91,000 m2 and 132,000 m2, for W04-B and C, respectively, according to the approved specifications
- Compaction up to a minimum of 95 %. Compaction shall be completed as soon as possible after the material has been spread
- Carrying out all necessary laboratory tests as directed by the supervising engineer

Base

- Spreading a base layer of coarse gravel with a thickness of 10cm for a total area of 68,000m2 and 94,500m2 for W04-B and C, respectively
- Compaction up to a minimum of 95 %.
- Carrying out all necessary laboratory tests as directed by the supervising engineer

Side Molds

- Building side molds with a total length of 22,000m and 30,000m, W04-B and C, respectively, of municipality type with casting of kicker (50x5) with a slope of 5-8%. Casting of classifiable back of mold (20x15) cm with compression strength of no less than 250 kg/cm^2.
- Sealing molds with cement mortar (masonry) and sand (3: 1) as directed by the supervising engineer
- Carrying out the necessary laboratory tests.

Concrete Pavement/Surface:

- Spraying of a prime coat with a ratio of 1 liter/m^2, according to the technical conditions and specifications of roads and bridges (R9) along with the directions of the Supervisor
- Paving an area of 68,000 m^2 and 94,500 m2, W04-B and C, respectively, with asphalt concrete (stabilizer) with a thickness of 10 cm
- Compaction of no less than 97%.

3.7.3.2 Operation Activities

Road Surface Maintenance[7]

Roads surfaces should be reworked only as necessary to provide a smooth running surface and a good slope for drainage. During all seasons roads will require continual monitoring for surface and subgrade wear or deterioration, especially during rainy seasons, as rutting and loss of ballast often occur during the rainy season.

[7] http://www.fao.org/3/t0099e/T0099e07.htm

3.8 Waste Generated

3.8.1 Construction Phase

Waste generated during the construction phase is both domestic and construction waste, hazardous and non-hazardous. The generated waste would include the following:

- Excavated soil.
- Trimmings of steel.
- Metals, wood, cement sacks, sand and gravel, cut off cables, cut off pipes, garbage from daily activities of workers.
- Wasted or faulted materials including conductors, insulators, pipe fittings, etc.
- Domestic solid wastes from construction offices. The expected quantity is 20kg/day for EODP-AF-NIN-W04A
- Domestic wastewater from the construction camps/offices
- Hazardous wastes, include; concrete washout, spent welding materials, solvents, paints, adhesives, asphalt spills, concrete spills, spilled oils from the operation and maintenance of the construction machinery and gaseous emissions from the construction machinery engines

3.8.2 Operation Phase

Wastes generated during the operation phase will result either from maintenance, repair and/ or replacement activities. All wastes shall be collected by a licensed contractor and disposed in a designated waste facility. Among these wastes are the following:

- Waste cables that will be replaced along the distribution lines.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be made of inert materials that does not cause high risk in disposal/recycling procedures.
- Cut off pipes and fittings

3.9 Expected Equipment

The contractors shall provide all the necessary equipment and shall prepare a yard on the project site for storing the equipment. The equipment that will be used in the project, include:

- Jack hammers for breaking old asphalt and concrete
- Portable generators
- Trench drilling machines
- Manual excavation tools
- Welding machines
- Electricity poles lifting cranes

Roads Rehabilitation and Reconstruction[8]

All equipment, tools and machines used in the performance of the work shall be either new or in the top grade second hand condition or be subject to the approval of the Engineer, and shall be maintained in satisfactory working condition at all times. Equipment that will be used for the roads rehabilitation and construction, are:

- *Blade Graders*
- *Sprinkling equipment:*
- *Transporting and mixing equipment.*
- *Compaction Equipment:*
  Includessmooth-wheeled power rollers, pneumatic-tyred rollers, rubber-tyred compactors, vibratory rollers, vibrating - plate compactors or vibro tampers.

Smooth wheeled roller

Pneumatic tyred roller

Vibratory Roller

Figure 3-19 Various Types of Compactors

3.10 Labour

The expected number of workers for the electricity distribution network and roads lighting rehabilitation is 10-25 temporary local workers. They live in their houses in Mosul city. With regards to the Overhead distribution lines (OHDL) and the storm drainage network, the estimated number of workers during the peak of construction is about 45-60 workers per each construction

[8] Standard Specifications for Roads and Bridges of Iraq (2003)

site. The contractor/s will recruit the semi-skilled and unskilled workers from the Mosul City. Regarding the anticipated number of workers in the construction sites, it might be increased based on the number of concurrent construction sites and the time plan allocated for construction activities.

Given the fact that the majority of workers will be recruited from the local community, it is not anticipated to have accommodation activities. Only expatriate workers will be given accommodation allowance. The total number of expatriate workers will be relatively limited.

3.11 Resources

3.11.1 Water Resources

The source of water for domestic use (drinking, food preparation, personal sanitation, washing utensils) is the public water network in the district. Expected quantity of water for domestic use is 50litres per person per day.

3.11.2 Electricity

The source of electricity is the national grid in addition to generators that will be provided by the contractor to be used during power cuts.

3.11.3 Fuel

The contractor shall provide all the required fuel from local gas stations.

3.12 Construction Camps and Offices

Construction camps are composed of a number of caravans for storage of primary equipment, administration offices, documents keeping, bathrooms, rest area and changing rooms. Domestic wastewater will be discharged in underground septic tanks that are going to be transported by special trucks and disposed in landfills outside the borders of Mosul city licensed by Mosul municipality. Coordinates of the construction camps that were allocated by Mosul municipality in Al Samah district are 36°21'42.13"N and 43°13'59.66"E.

As explained in the above sub-section, drinking water will be supplied by the public water network in the district, electricity will be supplied from the national grid and the generators and fuel will be obtained from local gas stations.

4. ENVIRONMENTAL AND SOCIAL BASELINE

4.1 Introduction

4.1.1 As mentioned in the OP 4.01 – Environmental Assessment

According to the World Bank Operational Policy OP 4.01, the project is classified among the projects that are likely to have potential, limited adverse environmental and social impacts for which the development of a full-scale ESIA is not required. The proposed project will not have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. Environmental impacts of the project shall be analyzed and mitigation measures proposed for expected negative impacts, along with an Environmental Management and Monitoring Plan.

4.1.2 World Bank Policy- Access to Information

This Policy governs the public accessibility of information in the Bank's possession. The World Bank allows access to any information in its possession that is not on a list of exceptions.

This Policy is based on five principles:

• Maximizing access to information;

• Setting out a clear list of exceptions;

• Safeguarding the deliberative process;

• Providing clear procedures for making information available; and

• Recognizing requesters' right to an appeals process.

Project Description, Ninawa Project comprises three sub-projects. All three sub-projects are located on the left bank of Mosul City, in Al Samah and Yarimcha Districts. Mosul is a major city located in Ninawa Governorate in the Northern part of Iraq, approximately 400 km north of Baghdad. Mosul stands on the west bank of the Tigris River.

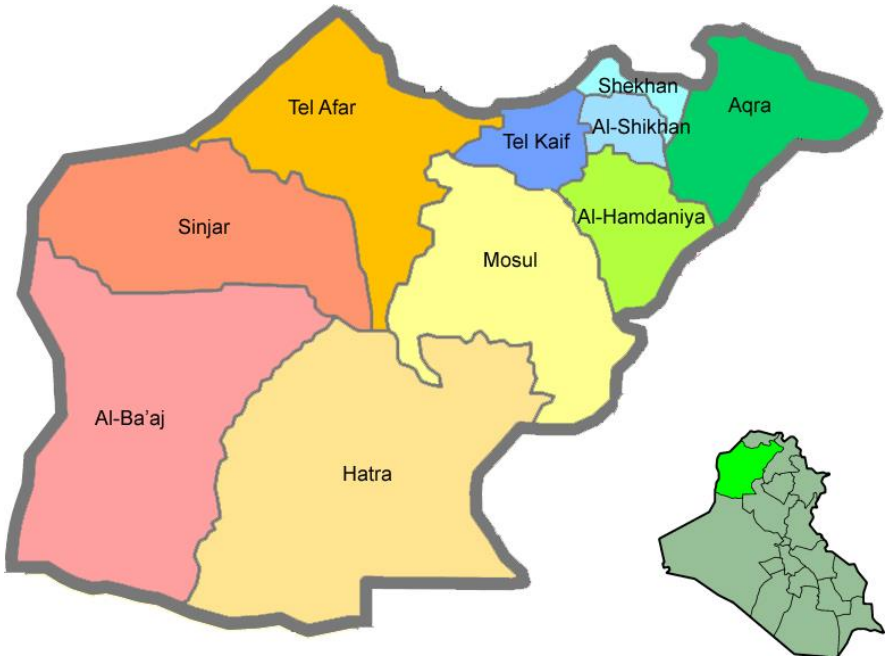


Figure 4-1 Ninawa governorate

4.2 Sensitive Receptors

The habitat surrounding the project areas is an urban habitat. The sensitive receptors surrounding the project and their distances from the project areas (west Al-Samah and east Al-Samah) are shown in Table 4-1.

Table 4-1 Sensitive Receptors in East and West Al-Samah Project Areas

Receptor	West Al-Samah	East Al-Samah
Tigris River	6.1 km	7.9 km
Eden School	0.28 km from pipeline – 0.75 km from streets	1.72 km
Arkan Health Center	0.325 km	Inside Project Area
Al Bawasel School	0.5 km	0.74 km
Nearest Park	0.65 km	2.1 km

Figure 4-2 and Figure 4-3 show the sensitive receptors in the project areas on the maps

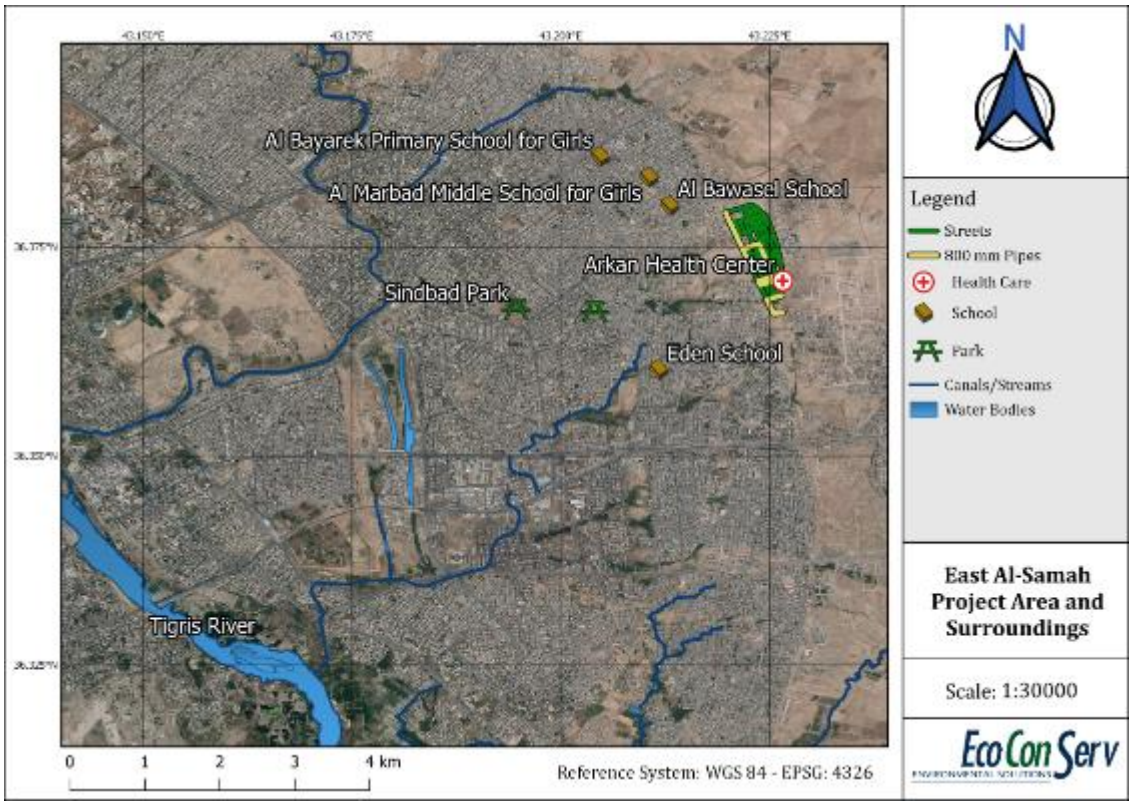


Figure 4-2 Sensitive Receptors in East Al-Samah Project Area

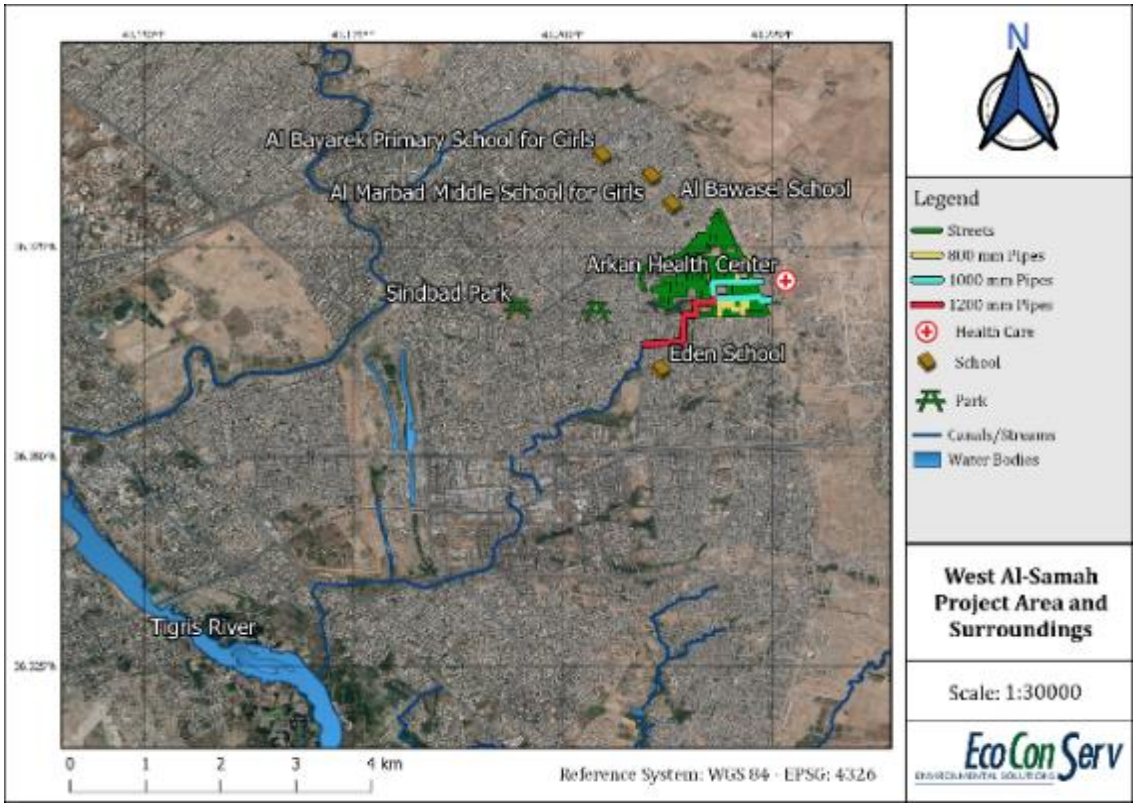


Figure 4-3 Sensitive Receptors in West Al-Samah Project Area

4.3 Physical Environment

4.3.1 Climate[9]

Mosul's climate is classified as warm and temperate. The winter months are much rainier than the summer months in Mosul. That climate is considered to be hot dray summer (Csa) according to the Köppen-Geiger climate classification. The average temperature in Mosul is 19.8 °C. The temperatures are highest on average in July, at around 32.9 °C. January is the coldest month, with temperatures averaging 7.2 °C. The average rainfall is 456 mm. The least amount of rainfall occurs in June; average 0 mm. Most of the precipitation falls in March, averaging 95 mm. See Figure 4-4 for the temperature and precipitation per month and Table 4-2 for average, minimum and maximum temperatures per month in Mosul.

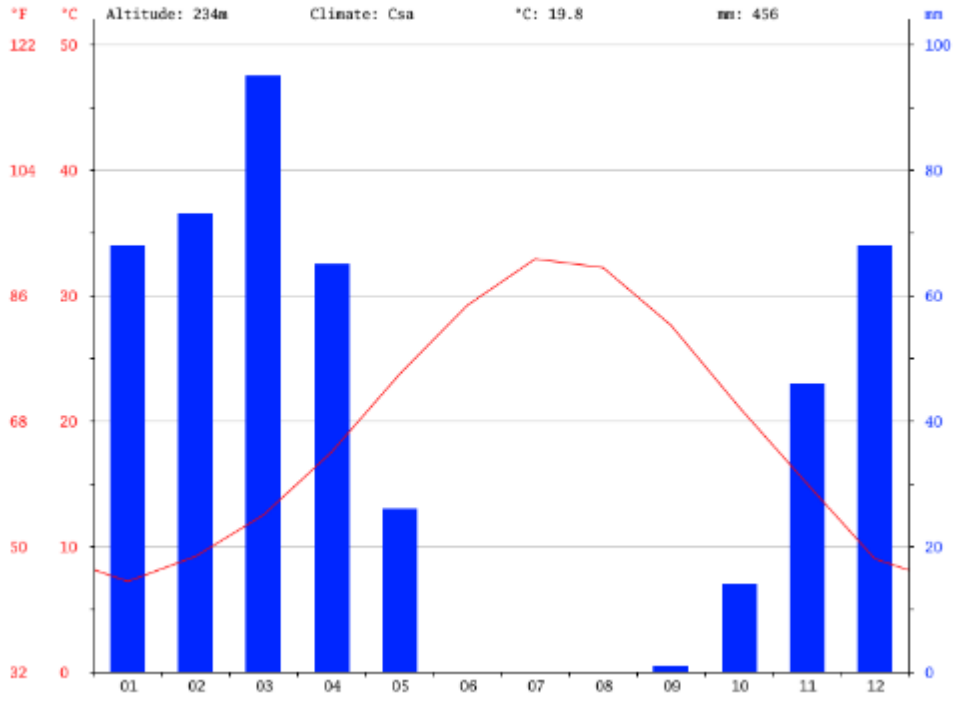


Figure 4-4 Climate Graph in Mosul

Table 4-2 The Weather in Mosul Per Month

	Januar y	Februar y	Marc h	Apri l	Ma y	June	July	Augus t	Septembe r	Octobe r	Novembe r	Decembe r
Avg. Temperatur e (°C)	7.2	9.2	12.5	17.5	23. 7	29.2	32.9	32.2	27.6	21.1	15	9
Min. Temperatur e (°C)	1.9	3.5	6.2	10.3	15. 4	19.4	22.9	21.8	17.1	11.8	8	3.3

[9] (https://en.climate-data.org/asia/iraq/nineveh/mosul-1248/)

Max. Temperature (°C)	12.6	15	18.8	24.7	32.1	39	42.9	42.6	38.1	30.5	22	14.7
Avg. Temperature (°F)	45.0	48.6	54.5	63.5	74.7	84.6	91.2	90.0	81.7	70.0	59.0	48.2
Min. Temperature (°F)	35.4	38.3	43.2	50.5	59.7	66.9	73.2	71.2	62.8	53.2	46.4	37.9
Max. Temperature (°F)	54.7	59.0	65.8	76.5	89.8	102.2	109.2	108.7	100.6	86.9	71.6	58.5
Precipitation / Rainfall (mm)	68	73	95	65	26	0	0	0	1	14	46	68

4.3.2 Ambient Air Quality and Noise Level[10]

Ambient air quality and noise level measurements are not currently available for the specific project areas. As the roads in the project areas are in bad conditions, partially destroyed due to the recent war conditions and terrorism, one main source of pollution is the dust generated by wind, construction activities and traffic. Also, another source of pollution in the project areas are the emissions caused by traffic.

4.3.3 Geology

Iraq can be divided into five physiographic zones[11];

1. Zagros Mountain Region
2. Foothills Region
3. Desert Region
4. Jazeera Region
5. Mesopotamian Plain Region

The EODP activities will take place between Jazeera Region and the lower fold of the Mesopotamian Plain Region which is mainly composed of flat plateau.

Jazeera Region: includes the residues of an old inland sea in which mainly gypsum was deposited. It is a steppe and desert plateau. The area is relatively flat broken by some hills and low mountain ridges which are an extension of the mountain ridges to the east. The mountain ridges go in an east west direction; in between there are level to undulating and at places rolling terrain.

Mesopotamian Plain Region: is a geological depression filled with river sediments which covers the central and southern parts of Iraq. It is a plain of the Tigris and Euphrates rivers.

[10] http://documents.worldbank.org/curated/en/136081544683943554/pdf/AL-MOSUL-SECOND-BRIDGE-ALHURIYA-IN-NINEVEH-GOVERNORATE-FINAL-ESIA-DOCUMENT-ilovepdf-compressed-1.pdf

[11] EODP (P155732) and EODP-AF (P161515) Updated ESMF, (2017)

4.3.4 Groundwater

In General, groundwater aquifers in Iraq consist of extensive alluvial deposits of the Tigris and Euphrates rivers, and are composed of Mesopotamian-clastic and carbonate formations. Water quality ranges from 300 to 1,000 ppm[12].

Tests for the groundwater in the project areas were not carried out. However, according to the ESMF, there are no specific aquifers in the area. Therefore, the interaction between the project activities and water aquifers is not expected[13]. Moreover, the hydrogeological map of Iraq shows that the groundwater depth in Mosul is in the range of 30-40m, as shown in

Figure 4-5.

An ESMP, posted on the World Bank's website, carried out for Mosul's second bridge (Al-Holiya bridge) located at coordinates 36°20'25"N 43°8'36"E, stated that the groundwater depth in the project area ranged from 30-40 m below surface, which is slightly brackish with a salinity of 1000-3000 ppm. Generally, the salinity of the groundwater increases from north to south of Iraq.[14].

[12] **(http://www.fao.org/nr/water/aquastat/countries_regions/IRQ/)**
[13] EODP (P155732) and EODP-AF (P161515) Updated ESMF, (2017)
[14] http://documents.worldbank.org/curated/en/136081544683943554/pdf/AL-MOSUL-SECOND-BRIDGE-ALHURIYA-IN-NINEVEH-GOVERNORATE-FINAL-ESIA-DOCUMENT-ilovepdf-compressed-1.pdf

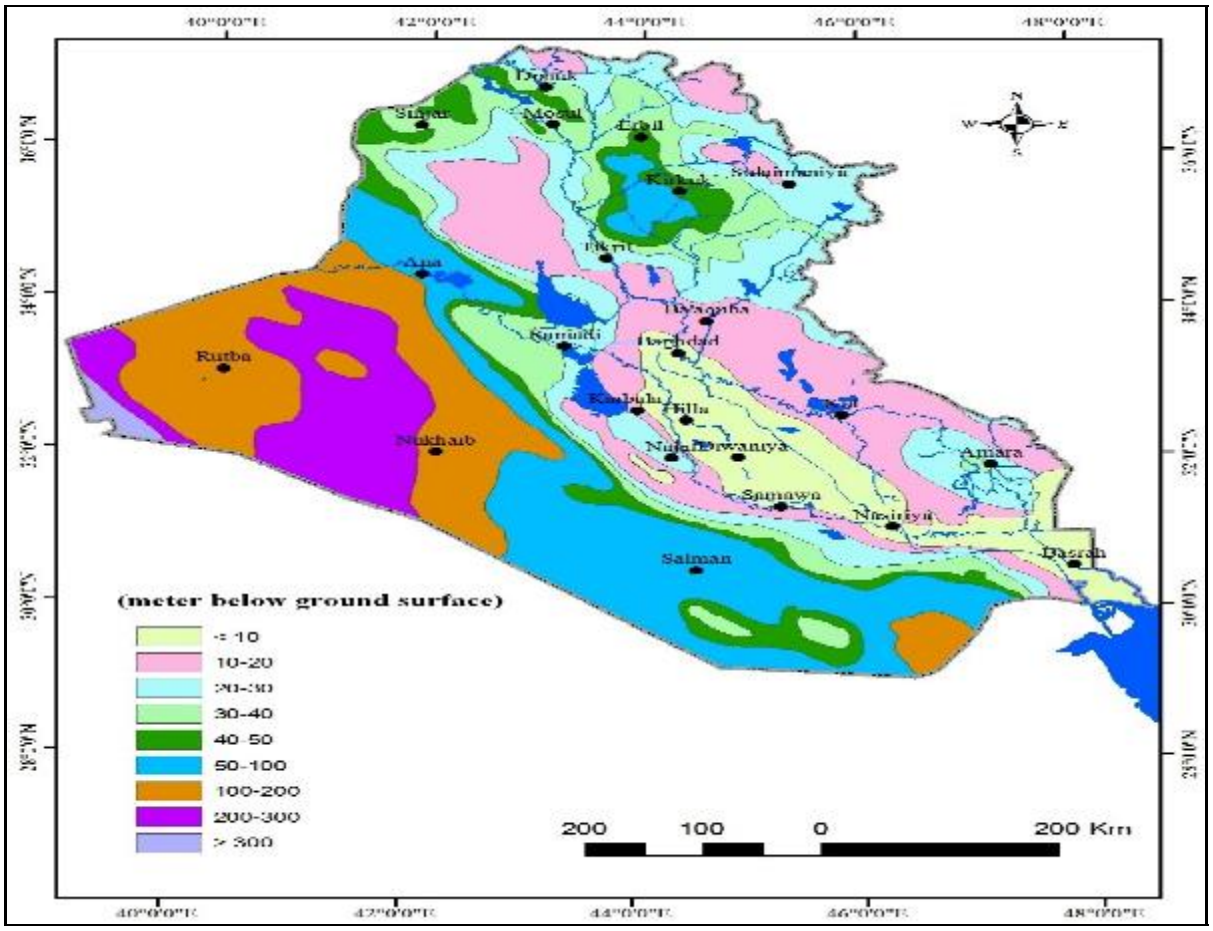


Figure 4-5 The Hydrogeological Zones of Iraq[15]

A study of the groundwater quality was carried out in the left bank of Mosul city in 2018, concluded that the tested groundwater was unsuitable for drinking and domestic uses, as the water quality index (WQI) ranged from 24.49 to 31.90 (poor water quality). Those low values of WQI was found to be mainly from the higher values of EC25, Total Hardness, Na, SO4 and bacterial contamination in the groundwater. The analysis revealed that the studied groundwater need some degree of treatment before consumption[16].

[15] H. Al-Jiburi and N. Al-Basrawi, Hydrogeological Map of Iraq. Iraqi Bulletin of Geology and Mining, Vol. 11, No.1, P. 17-26, 2015.

[16] https://www.researchgate.net/publication/328030850_Application_of_CCME_WQI_to_Assessmt_the_Environmental_Status_of_Groundwater_for_Drinking_and_Domestic_uses_in_Left_Bank_of_Mosul_City_North_Iraq

4.3.5 Surface water

The main surface water body in Mosul is Tigris River. Regarding how far the projects areas are from Tigris River; Yarimcha is around 2km far, east Al-Samah is 7.9km far and west Al-Samah is 6.1km far, see Table 4-1. [17].

4.3.5.1 Discharge

At Mosul, the annual average discharge of the Tigris River for the period 2000–2013 is estimated at (522 m^3/s). Its maximum mean discharge can reach 1,629 m^3/s in April and its minimum mean discharge can reach 219 m^3/s in September.

4.3.5.2 Water Quality

Based on recent assessments of Water Quality Index (WQI) for Tigris River in Mosul city, there is a general progressive decline in the WQI values along the downstream that indicated an increase in pollution. This is attributed to the effluent discharged from the factories, hospitals and mainly to the wastewater discharges which pours directly into the river. The water quality data for all the sampling stations are categorized as Medium. Dissolved oxygen (%), E. coli, Total Dissolved Solids and Temperature are the main parameters which lower the overall WQI value in all stations. Based on WQI, the water of Tigris River was classified as class III. Consequently, it requires treatment before use for water supply[18].

4.4 Biological Environment[18]

The areas where EODP and EODP-AF activities will take place are close to the Plateau Area and are far from the marchlands (which is located in the east southern part of Iraq) and far from the desert areas (located in the far west of the country). No significant terrestrial habitats or ecosystems are present in the EODP or EODP-AF intervention areas.

4.4.1 Flora and Fauna[18]

In the EODP and EODP-AF work areas (Plateau), the flora and fauna species are not classified as rare or endangered. Those species are common and abandoned in many locations. The combination of rain shortage and extreme heat makes most of Iraq a desert. Due to very high rates of evaporation, soil and plants rapidly lose the moisture obtained from the rain, and vegetation cannot survive without extensive irrigation. However, some areas, although arid, have natural vegetation unlike the desert.

In conclusion, there are not significant habitats/ ecosystems in the project areas that could be affected by the project activities.

4.5 Socioeconomic Baseline

This section presents a description of the baseline socio-cultural characteristics of the proposed project areas. It briefly highlights the following: administrative divisions; demographic

[17] http://documents.worldbank.org/curated/en/136081544683943554/pdf/AL-MOSUL-SECOND-BRIDGE-ALHURIYA-IN-NINEVEH-GOVERNORATE-FINAL-ESIA-DOCUMENT-ilovepdf-compressed-1.pdf

[18] EODP (P155732) and EODP-AF (P161515) Updated ESMF, (2017)

characteristics, living conditions, human development profile, land use, traffic, cultural heritage and women and vulnerable groups.

4.5.1 Administrative Divisions

The Project will be implemented in Ninawa Governorate in the Northern areas of Iraq. It is bordered by Duhok Governorate from the north, Erbil and El Ta'mem Governorates from the east, Syria from the west, see Figure 4-6. Specifically, it will be implemented in Al-Samah and Yarimcha districts (*Hai*) in Mosul City.

Secondary data was collected on the level of Ninawa Governorate, yet limited data was available on the level of Al- Samah and Yarimcha districts. Therefore, the study team collected primary data on the level of the left side of Mosul City (El Ganeb El Aysar). The left side includes Al-Samah and Yarimcha districts (Hai)

Figure 4-6 Project Area in Mosul City[19]

[19] http://www.elfurat.com.tr/ar/News/155/ulkeler-ve-iller-arasi-mesafe

4.5.2 Demographic Characteristics

With regards to population composition, Al-Samah and Yarimcha districts (Hai) in the left side of Mosul City are characterized by a significantly diversified population composed of Arabs and Kurds, Muslims and Christians, Yazidis, Shabaks and El Kania.

4.5.2.1 Population

Ninawa Governorate's total population reported in the Multiple Indicator Cluster Survey 2018 (MICS) developed by the Central Statistical Organization is 3,729,998 persons. Based on the meeting conducted with the Central Statistics Organization (CSO), the total number of inhabitants in the Left side of Mosul is 245,000. Based on the results of the meeting conducted with community people, there is a significant number of children aged 15-18 residing in the project site.

Table 4-3:Population of Ninawa Governorate[20]

Aspect	Ninawa	Mosul's Left Side
Total population	3,729,998	245,000
Males		124,950
Females		120,050
Households		45,000

4.5.2.2 Age structure

There is no available data on the age distribution on district level for Al-Samah and Yarimcha districts. However, data on the age distribution on Ninawa Governorate level has been published by the CSO in 2018. Accordingly, about 55% of the total population of Ninawa fall under the category of 15-65-year-olds. However, those who fall in the age category of less than 15 years represent about 45%. This is an indication about growing young communities.

4.5.2.3 Rate of Natural Increase

The natural increase rate is calculated by deducting the mortality rate from the birth rate. The remaining figure is the population natural increase value. Population increase on the level of Ninawa Governorate was 2% in 2018 (CSO).

4.5.3 Living Conditions

Living conditions attributes to household size and density, access to basic services, and access to health facilities. As became evident during the conducted site visits, the majority of residents reside in houses of one to two stories.

[20] Multiple Indicator Cluster Survey 2018 (MICS) developed by the Central Statistical Organization (CSO)

4.5.3.1 Household Size

The approximate total number of households in Mosul's left side is 45,000 households (based on the meeting with the municipality of El Mosul). The average household size is 5.44 person per household in the left side of Mosul City.

4.5.3.2 Access to Basic Services

Basic services in Al Samah and Yarimcha districts tend to be limited in terms of quantity and quality. Reference to the meeting conducted with CSO and the collected data MICS, only a percentage of the population have access to basic services. It can be concluded as follows:

4.5.3.2.1 Access to Electricity

100% of the total population residing in Al-Samah and Yarimcha have access to electricity as reported by the municipality of Mosul and the CSO. However, the electricity network in Al-Samah and Yarimcha districts suffer from frequent power cuts, as it is in an extremely poor condition. Most of the overhead distribution network was damaged. It was reported by consulted groups that the majority of residents suffer from electricity cuts for durations of more than 8 hours daily. Therefore, residents are obliged to use generators and informal access to the public electricity network.[21]

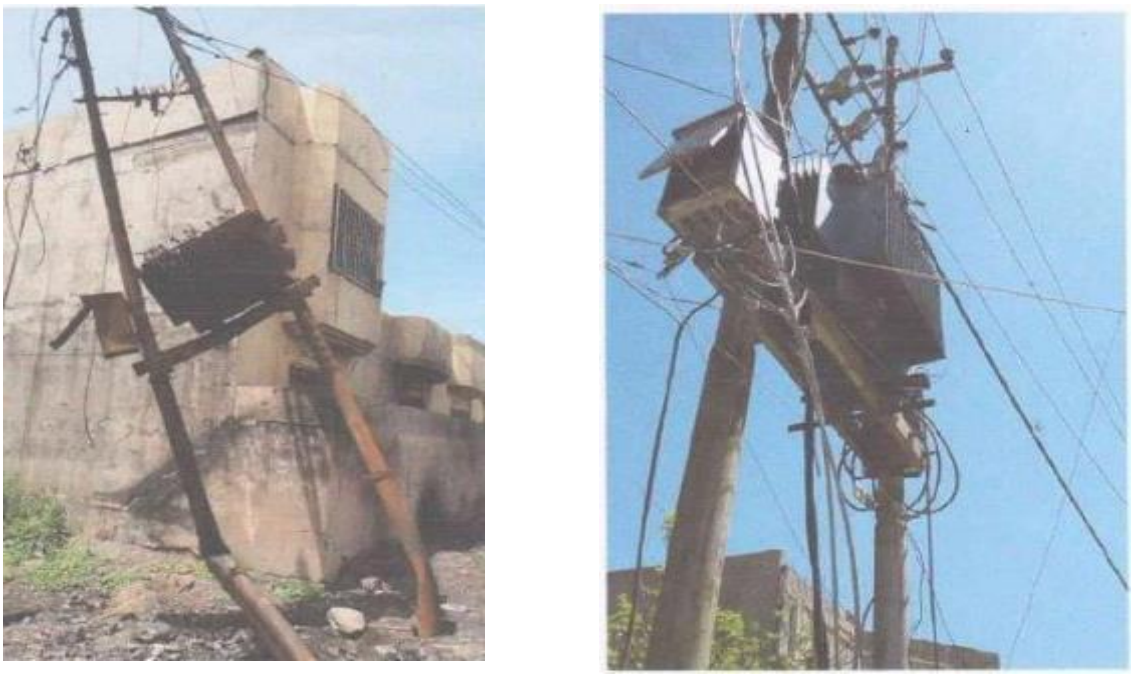


Figure 4-7: Damaged electricity infrastructure

[21] Based on the information obtained during the meeting conducted with the Central Statistical Organization (CSO) in November 2019

4.5.3.2.2 Access to potable water and sanitation

Those who have access to water supplies in the Project districts are limited to about 70% of the total population residing in Al Samah and Yarimcha districts. Community people often raise complaints of deteriorated water quality, namely: water color and odor, as reported in the meeting carried out with the CSO in October 2019. However, the consulted groups did not report any concerns related to water quality.

As reported by CSO during the meeting carried out in October 2019, there are no sewage systems available in the project areas (Al-Samah and Yarimcha)[22]. The majority of community people rely on septic tanks that are evacuated periodically. Evacuation is managed by the municipality of El Mosul and the cost per evacuation amounts to 40 USD. The total number of septic tank evacuation annually is once for residential units and twice for public dwellings.

Table 4-4: Water and Wastewater Sector in Ninawa Governorate[23]

Water supply 2017	
Water imports of the Tigris and Euphrates for the water year 2016/2017 (billion m³ / year) / Iraq	**40.69**
Proportion of population served by drinking water systems	**87.1 %**
Total amount of water for the marshes (billion m³ /year) / Iraq	**3.1**
Domestic wastewater 2017	
Total pumping stations	**7**
Proportion of population served by public and shared sewerage networks	**2.3%**
Proportion of the population served by the independent treatment system (septic tank)	**97.7%**
Proportion of population served by rainwater networks (low and shared)	**13.3 %**

4.5.3.2.3 Access to health facilities

Health facilities are located in the project sites and tend to be sufficient for the community people. In 2018, the MICS report indicated a total number of health institutions of 317 in Ninawa Governorate, 19 of them are governmental, and 178 are allocated as primary health facilities.[24]

[22] CSO 2019
[23] Multiple Indicator Cluster Survey, 2018 (MICS) developed by the Central Statistical Organization (CSO)
[24] Multiple Indicator Cluster Survey, 2018 (MICS) developed by the Central Statistical Organization (CSO)

During the community meetings with El Mosul municipality's health department and planning councilor, a vast number of health facilities was reported in El Mosul, including public hospitals, private hospitals, ambulances and private clinics. However, the number of health facilities remains limited due to the lack of proper infrastructure and medications. Further, there is critical lack in the number of physicians and medical equipment. The most dominant diseases in the project site are cancer, obesity and chronic diseases such as blood pressure and diabetes. Additionally, there is a significant number of disabled people, affected during the war with ISIS.[25]

Figure 4-8: Ninawa public hospital

Figure 4-9: Health unit

4.5.4 Human Development Profile

The Millennium Development Goals (MDGs) established ambitious goals for economic and social development, allocating eight broad targets. The human development profile is based on education, employment, work status, and poverty index.

4.5.4.1 Education

As illustrated in the Figure below, in Ninawa Governorate, there are 1175 primary schools and 445 secondary schools. Most schools are governmental; whereas, community based schools and religious schools are relatively limited. Figure 4-2 and Figure 4-3 show the schools in east and west Al-Samah, respectively. It was reported by one of school teachers that street conditions affect the attendance rate, especially, during rainy season.

[25] According to meetings conducted with community people in October 2019

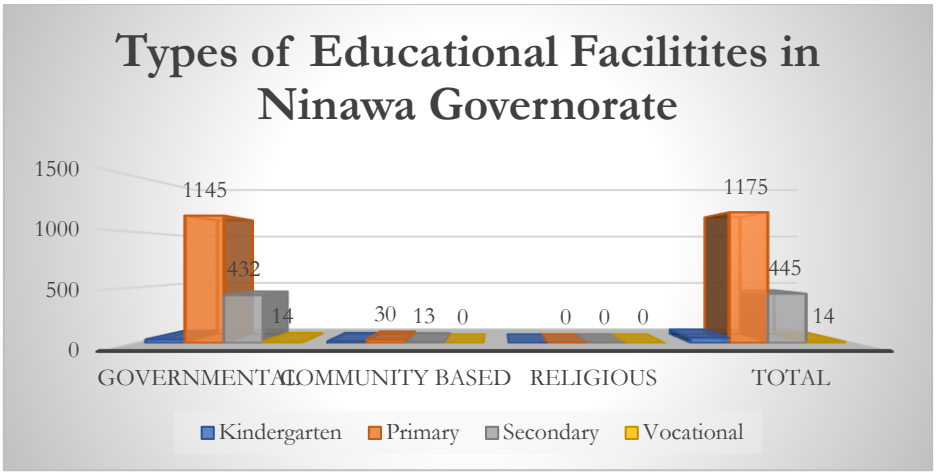


Figure 4-10: Distribution of educational facilities below universities in Ninawa Governorate[26]

4.5.4.2 Unemployment and work status

Community people within labor force in Ninawa Governorate are estimated at 39.4%.[27] The total unemployment ratio is about 19.2% of the total labor force. This can be attributed to the type of predominant human activities in the areas of Ninawa Governorate, which are mainly agricultural and animal husbandry. Additionally, there are only a few industrial factories in Ninawa Governorate, namely 975.

The main economic activities are agriculture and raising livestock. The total percentage of people occupied in the agricultural sector is estimated at 70% in the Project areas. Accordingly, the majority of community people are farmers. They tend to have limited industrial background. Therefore, it is anticipated that the majority of technical workers and engineers will be recruited from outside the area.

There is a significant gap between males and females, as about 35% of males are employed, whereas only 20% of females are employed. Average unemployment rate in the Project sites is about 30% among males and 10% among females. It is worth mentioning that the majority of females are not willing to work. Therefore, they are not identified as unemployed.[28]

4.5.4.3 Poverty Index

Total poor people are estimated at 30% of households in the Project area. The total annual per capita expenditures are not defined due to the absence of information.[29]

[26] Multiple Indicator Cluster Survey, 2018 (MICS) developed by the Central Statistical Organization (CSO)
[27] Multiple Indicator Cluster Survey, 2018 (MICS) developed by the Central Statistical Organization (CSO)
[28] Information meetings with El Mosul municipality, planning councilor and the information shared was based on Ministry of Labor 2017
[29] According to the outcomes of Meetings conducted with the municipality of Mosul in 2019

Community people reported that they suffer due insufficient marketing of the agricultural products. They also face rigid competition from imported agricultural products originating in neighboring countries. Therefore, they were obliged to raise complaints about imported vegetables and fruits.

4.5.5 Land Use

Almost the majority of lands in the project area is classified as residential land. Few percentages of lands are used for industrial activities, for instance electricity production power plants.

4.5.6 Traffic

There are various types of transportation means available in the Project sites. They are not limited to public transportation; as private transportation means are also available. As reported by the consulted groups, cost of traffic is relatively high.

The majority of the project area's roads tends to be dusty and unpaved. Additionally, parts of the roads are of extremely poor conditions. Almost all community people suffer from the deteriorated street conditions, particularly, during the rainy season.

Figure 4-11: Damaged streets in Al Samah district

Figure 4-12: Leakage of water in the main roads

Figure 4-13: Affected roads during rainy season (children passing streets)

4.5.7 Cultural Heritage

The rehabilitation activities do not extend to any historical or cultural sites. No cemeteries, historical-cultural monuments, churches, or mosques near the project need to be removed. However, there are a specific numbers of cultural heritage objects within a radius of 5km of the project area. The study team was able to define graveyards, mosques, and monuments located in the proximity of project sites.

4.5.8 Women and Vulnerable Groups

Gender-based discrimination in education is both a cause and an outcome of poverty and results in a breakdown of social and economic development. In Iraq, the ratio of female to male is 0.94 in primary school and 0.85 in secondary school. These statistics reflect the inequality in education among the two sexes at each level.

Furthermore, 28.2% of women aged 12 years or older are illiterate, more than double the male rate of 13.3%. The percentage increases significantly for young women (aged 15-24) living in rural areas where the illiteracy rate is 33.6%.[30]

Huge differences prevail in the labour market between women and men: only 14% of women are working or actively seeking work compared to 73% of men; 21% of active females are unemployed compared to 11% of active males. The percentage increases to 27% for young women and is significantly higher in urban areas than in rural areas, where women are mainly employed in the agricultural sector.

[30] T/Downloads/20130312_Woman_Factsheet.pdf

Children in the project site are at danger as they are obliged to cross the damaged streets. They might fall down and be injured. Children also tend to work on the farms, despite their young age, children between 10-18 years old always work in the field.

5. ASSESSMENT OF POTENTIAL RISKS AND IMPACTS

The assessment focuses on identifying the environmental and social issues. The ESMP includes collecting data from previous reports and studies for obtaining background data about environmental and socio-economic characteristics of the project area.

At an early stage, baseline surveys have been carried out to obtain information as well as site visits to fill in gaps in data and information on the characteristics of the existing environment of the proposed project area. The identified potential environmental impacts on the physical environment are then evaluated against baseline conditions at the proposed location, and the reasonable performance standards which are assumed to be set during the construction and operational phases of the project. Positive and negative potential impacts on the environment during the project phases will be presented in this section.

The environmental and social impacts assessment is based on both quantitative and qualitative data available, as well as the consultant's experience.

The assessment is based on the methodology presented in the ESMF document.

5.1 Summary of Positive Potential Impacts during Pre-construction and Construction phases

5.1.1 Direct job opportunities to skilled and semi-skilled labourers

The project is anticipated to result in creation of various direct job opportunities. Based on previous experience in similar projects implemented recently by the Project owner the municipality), the anticipated number of workers to be recruited on peak of construction period per each sub-project will be at minimum as follows:

Type of job	Total number per site	Required skills
Site engineer	1	Highly skilled
Supervisors (electrical/ water supply, civil …other)	2	Skilled
Technicians	15-20	Skilled
Standard workers	20-30	Low/semi-skilled
Drivers and co-drivers	5-7	Low/semi-skilled
Administrative	2	Semi-skilled/skilled

The total sum of each site varies between 45- 60 laborers per sub-project. The contractor might recruit more people to meet the construction deadlines. At least 50% of these jobs can be occupied by local people.

In order to maximize employment opportunities in the local communities it is anticipated that on the job capacity building activities will be required for currently unskilled workers. On-the-job training will also supplement opportunities for the local workforce for both temporary

construction roles and for long-term employment during the operation phase, where these are available.

5.1.2 Indirect job opportunities

As part of the construction stage, a number of indirect job opportunities are expected to arise, due to the need for more supporting services to the workers and contractors who will be working in the various locations.

5.2 Summary of Negative Potential Impacts during Pre-construction and Construction Phases

5.2.1 Negative Environmental Impacts

5.2.1.1 Noise

Normally construction works include noisy activities related to the operation of construction equipment, possible hammering and drilling works in addition to the noise generated from construction related trucks. The noise impacts could be analyzed in two main aspects: noise impact within the construction areas, and the noise impact on the neighboring receptors.

Impact Significance:

Construction noise is likely to affect neighboring areas if it exceeds the permissible limits. The project is going to take place in residential areas; Al-Samah and Yarimcha. For noise impact upon workers, within the construction site, it is possible that construction workers could be exposed to relatively high levels of noise. This could be mitigated through application of the precautions normally taken by construction labor. Accordingly, this impact has been classified as a Moderate Impact, which could be further minimized and fully controlled if construction workers used safety gear as recommended in the ESMP.

Accordingly, the impact is expected to be of Moderate significance.

5.2.1.2 Air Quality

Excavation, filling, loading, unloading of raw materials and transportation of the construction equipment and trucks cause suspension of airborne dust that raises the particulate matter concentration on ambient air (PM10, PM2.5), especially that a large part of the roads in the projects areas are unpaved and/or damaged. These emissions are temporary and its severity depends on the construction activity, meteorological conditions, and pavement conditions of the roads.

Another source of air emission during construction is the exhaust gaseous emissions of construction machinery and vehicles visiting and leaving the site, such as SO_x, NO_x, CO, VOCs, etc. The extent of these emissions depends on the number of machineries working concurrently at the site, the type and efficiency of the engines and also the climate conditions.

Impact Significance:

The project area is a residential area; therefore, the receptor sensitivity is considered Medium. However, the duration of the impact is considered Low as it will only take place during the project

activities. Also, the spatial extent is local in the project area; therefore, it is considered Low. As a result, this impact could be considered Moderate

Accordingly, the impact is expected to be of Moderate significance.

5.2.1.3 Waste Generation and Hazardous Materials

Wastes generated during the construction phase are solid and liquid non-hazardous and hazardous waste. Construction non-hazardous waste entails excavated soil. The excavated soil will normally be accumulated on the RoW of the OHDL and on the route of the storm water drain and the rehabilitated roads.

Regarding the hazardous waste, it includes concrete washout, as after concrete is poured at a construction site, the chutes of ready mixed concrete trucks and hoppers of concrete pump trucks must be washed out. Also, equipment such as wheelbarrows and hand tools also need to be washed down. Concrete washout water is a slurry containing toxic metals. It's also caustic and corrosive, having a pH near 12. If the wash water is dumped on the ground, it can run off the construction site and enter roadside storm drains, which discharge to surface waters; Tigris. Moreover, rainfall may cause concrete washout containers that are uncovered to overflow and also transport the wash water to surface waters. Rainwater polluted with concrete wash water can percolate down through the soil and alter the soil chemistry[31]. Construction workers should handle wet concrete and washout water with care because it may cause skin irritation and eye damage.

Other types of construction wastes would include the following:

- Trimmings of steel and pipes
- Empty containers
- Metals, wood, cement sacks, sand and gravel, cut off cables and garbage from daily activities of workers.
- Wasted or faulted materials including conductors and insulators
- Domestic solid wastes from construction offices
- Domestic wastewater from construction offices
- Hazardous wastes, include; concrete wash water, spent welding materials, solvents, paints, adhesives, asphalt spills, concrete spills, spilled oils from the operation and maintenance of the construction machinery and gaseous emissions from the construction machinery engines

Impact Significance

Uncontrolled waste accumulation would have adverse impact on the environment, would block the storm water drainage system and be visually unacceptable; therefore, it would be of high significance. However, this impact during construction is characterized by being a short term

[31] https://www3.epa.gov/npdes/pubs/concretewashout.pdf

impact. Therefore, it can be concluded that the impact of wastes in general, if not properly managed, could be considered of Moderate significance due to the potential presence of hazardous wastes and the possibility of wastes being accumulated which has a negative visual impact.

Accordingly the impact is expected to be of Moderate significance.

5.2.1.4 Soil Contamination

Soil contamination could take place by hazardous wastes, such as spilled oils, concrete, or asphalt spills which could leach into the soil when subjected to rainwater. Additionally, improper discharge of domestic wastewater from construction offices and concrete washout water, would cause soil contamination. Also, improper handling and storage of construction materials can lead to soil contamination.

Impact Significance:

Along the proposed project, the impact on soil is considered Moderate due to the potential presence of hazardous wastes, yet for a limited period of time, as the construction phase is less than one year.

Accordingly, the impact is expected to be of Moderate significance.

5.2.1.5 Soil Erosion

Excavation works associated with this project may lead to increased soil erosion at the project site, especially if construction is done during the rainy seasons.

Impact Significance:

The three components of the project, especially road rehabilitation and storm water drainage, entail a moderate amount of excavation work.

Accordingly, the impact is expected to be of Moderate significance.

5.2.1.6 Water Resources

Water resources could get affected by the construction phase of the project either by contamination or increased consumption, as follows:

Contamination

- Improper disposal of debris or construction wastes on river banks
- Improper discharge of domestic wastewater from construction offices into water bodies
- Improper handling and storage of construction materials
- Underground water contamination by uncontrolled dumping of waste

Impact Significance:

The impact of the proposed project on underground water contamination is Insignificant, as the groundwater is situated at a large depth in the project's areas. As stated in the Environmental and Social Baseline of the study at hand, there are no specific aquifers in the area. Therefore, the interaction between the project activities and water aquifers is not expected[32]. Moreover, the hydrogeological map of Iraq in Chapter Four, shows that the groundwater depth in Mosul is in the range of 30-40m. Yet, standard prevention or precaution measures shall be prepared by the contractor prior to the construction. Similarly, the impact on surface water associated to the construction phase is Insignificant, as there are no water bodies that crosses the project areas.

Accordingly, the impact is expected to be Insignificant

Consumption

- An increase in the water consumption for construction purposes, such as concrete mixes, dust suppression and washing concrete mixers.
- An increase in the water consumption for domestic use by workers. The rate of drinking water consumption by workers is 50litres per person per day supplied by the water network in the area.

Impact Significance:

The impact on the increase in the consumption of water for domestic use and construction purposes, is Minor, as the project duration is Very Low (VL); less than one year.

Accordingly, the impact is expected to be of Minor Significance

5.2.1.7 Energy Consumption

The project will consume fossil fuels (mainly diesel) for the construction vehicles and machinery and for running generators. Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability.

Impact Significance:

The energy consumption impact is considered Minor since the project duration Very Low (VL); less than one year.

Accordingly, the impact is expected to be of Minor Significance

5.2.1.8 Flora and Fauna

As stated in Chapter Four of the ESMP, in the EODP and EODP-AF work areas (Plateau), the flora and fauna species are not classified as rare or endangered. Those species are common and

[32] EODP (P155732) and EODP-AF (P161515) Updated ESMF, (2017)

abandoned in many locations. Additionally, the project is a rehabilitation of an already existing network, so the project activities are not expected to destroy or alter any terrestrial habitats.

Accordingly, the impact is expected to be Insignificant

5.2.1.9 Extraction of Natural Resources

The extraction of raw materials, such as gravel and sand are going to have a negative impact on the availability of those natural resources, as they are not renewable in the short term. Additionally, the extraction process might disturb the land scape of the source of the materials and the natural habitat.

Impact Significance:

This impact is considered Minor, since it would take place only during the project duration, which is less than a year.

Accordingly, the impact is expected to be of Minor significance

5.2.1.10 Occupational health and safety

Construction activities are relatively dangerous, as workers could be exposed to accidents in any work environment. Exposure to construction site hazards can lead to injuries. To avoid such situations, all risks that can be encountered during normal work must be identified and recognized. According to WB OHS standards[33], each worker must have accurate information about their vulnerability to hazards or injuries in the workplace.

Following are the five key risks at the construction site as defined by the Occupational Health and Safety Administration (OSHA):

1. **Excavation and trenching** - drilling and trenching are considered the most dangerous works on construction sites.
2. **Fall** - falling from the distribution network poles that are 9-11 m high. The usual cause of this accident is slipping or foot stumbling or using a loose ladder (please see the photos in section 3.7.1.3). There are many reasons to be at risk of falling. To minimize this risk, the contractor must have a fall protection program as part of the occupational health and safety plan in the workplace.
3. **Stable and mobile stairs** - Fixed and mobile stairs are important causes of injuries and disasters among construction workers.
4. **Heavy construction equipment**. The main causes of such accidents include the injury of workers when the equipment is returning reverse or when the direction of the equipment is changed or when the brakes do not work properly, the flipping equipment injuring its operator, the equipment falling from the excavator, bucket and other mobile construction equipment.

[33] https://siteresources.worldbank.org/INTRANETENVIRONMENT/Resources/244351-1279901011064/OccupationalHealth.pdf

5. **Electricity** - electrification is a major risk to all workers in the workplace involved in stretching wires. As well as, there is a probability of electricity shock among workers who do excavation works during the construction of storm drainage network.

Occupational health and safety impacts are considered of Major significance

5.2.1.11 Community health and safety

Impacts on community health and safety are expected to result from:

- Emissions of gaseous pollutants and dust from equipment and machinery used.
- Increased background noise levels resulting from the operation of jackhammers, which surpasses permissible limits for residential areas;
- Waste accumulation in illegal dumping and potential burning of waste;
- Construction works will involve the use of equipment such as jackhammers and welding machines, which can cause injuries to local community as a consequence of contact.
- Street rehabilitation will limitation to the mobility of disabled people, school children and old people who will not be able to cross the roads safely
- There is a risk that electricity wires or conductors might fall on the pedestrian who pass under the electricity distribution network. There is no probability that the wires transmit electricity. However, they might fall on the passers.
- Old people, people with disability and children might get injured during passing the streets during rehabilitation.

Community health and safety impact is considered of Moderate significance

5.2.2 Negative Social Impacts

5.2.2.1 Traffic Flow (disruption of traffic) applicable to all three sub-projects

Mobilization of heavy machinery, asphalt breaking, and excavation, placement of piping and backfill activities are bound to limit traffic and accessibility to the areas. Mobilization, preparation and construction phases will entail narrowing roads by longitudinal and/or lateral excavation, totally blocking narrow or side roads, as well as limiting or prohibiting parking along the length of the works. Access to buildings and shop entrances may be limited or constricted in cases where excavations form obstacles for pedestrians and cargo.

As the overhead distribution network will be decommissioned, local access on selected parts of the road will be ceased and will likely restrict residents' access to, from, into and out of their houses, schools and commercial areas. As regular sized vehicles are not the principal mode of transport on local roads, congestion of cars is not anticipated. The inconvenience is expected to affect the flow of small vehicles by slowing them down.

The project will result in traffic congestion, inconvenience and disturbance to local communities and businesses, and in delay in the various daily activities due to the following:

1- Various vehicles may find difficulty in maneuvering the streets that will be dug during the project construction. This will increase their fuel consumption and reduce their ability to move quickly. Consequently, this will lead to transport of less clients as each errand will take more time.
2- There might be a disturbance to community people due to the traffic congestion

Traffic impacts on urban roads will result from digging in the streets and construction of storm water drainage as they will carry out construction activities in the local roads.

Traffic and access limitation impacts are of Moderate significance

5.2.2.2 Child labor and School Dropout

As mentioned in the baseline chapter, child labor is a common practice in the project communities in Iraq. Children work in construction projects as they accept lower salaries and are less demanding. Additionally, Iraq recently enacted Law 37/2015 (the Iraqi Labor Law). Chapter 3 of this Law states that the minimum age for employment is 15 years old. However, Iraq is also signatory to the 1989 International Convention on the Rights of the Child, which defines everyone under the age of 18 as a child who must have special protection and care.

Child labor might be detected in the project sites during the construction phase. The contractual agreement of the contractor must shed light on child labor risk and rigid obligations should be inserted in the construction contract.

The impact of child labor and school dropout is considered of **Major significance**.

5.2.2.3 Visual and landscape impacts

For construction and excavation works, the visual impacts are temporary, mainly from storage of drilling products and raw materials (cement bags, concrete mixers, construction waste, etc.). However, because of the short duration of exposure, they are regarded as of minor significance.

Impacts pertaining to landscape are expected to be of **minor** significance

5.2.2.4 Cultural heritage and monuments

Based on numerous previous studies conducted for the area of Mosul, there is a significant probability to encounter impacts related to cultural heritage, particularly, during the process of storm drainage network construction. Accordingly, a chance find procedures will be implemented.

Impacts on cultural heritage are expected to be of **minor** significance

5.2.2.5 Underground utilities

As a result of the construction work, existing underground utilities might be accidently damaged.

Damaging sanitary pipes, electricity underground cables and water pipelines result in severe disturbance to community people. Breaking a water supply pipe may result in cutting the supply to a number of residential units, which may lead residents to use other sources of water which may be either expensive or unsafe.

However, the time needed to resolve problems with damaged utilities is relatively short (no more than 4-8 hours). Additionally, the contractor will be responsible of compensating for damaged pipes as mentioned in the ESMP

Impacts on underground utilities are expected to be temporary, local, and of **minor** severity

5.2.2.6 Temporary Labor Influx

The contractor/s rely on recruiting workers and technicians during the pre-construction and construction works. The total number of workers is estimated to be about 45-60 workers in each project site according to the nature and type of sub-project.

Additionally, the contractor/s will have different working sites. Construction workers will be divided into teams. They might work in parallel or in sequence. Therefore, the number of workers varies according to the size of the work in each area. Consequently, the impact differs and varies according to each area. The temporary labor influx and presence of additional workers may have impacts on the project areas in terms of:

- **Risk of social conflict:** There are no potential effects of temporary labor influx on the culture of the society in the project areas; this is due to the focus of the implementing companies on the labor, whom are often from areas (cities- villages) adjacent to the project sites. The temporary workers also have the same culture and values as those in the project areas;
- **Increased risk of illicit behavior and crime:** The construction workers might have criminal history, therefore the contractor should ask for their criminal records and IDs;
- **Increased risk of communicable diseases and burden on local health services:** there is a probability to transmit diseases to community areas, particularly, hepatitis B and C and blood transmitted infections**;**
- **Local inflation of prices:** There is a probability to result in increase in food prices

Given the limited number of workers and being from the same project areas, the probability of labor influx impacts tends to be moderate.

The impacts of temporary labor influx are temporary, local, and of **moderate** severity.

5.2.2.7 Gender-based Violence (GBV)

There are many types of Gender-based Violence that are not applicable to the project activities and construction sites. Therefore, the consultant focused on the GBV issues that might be detected in the project site. They are as follows[34]:

[34] Source: file:///E:/IT/Downloads/GBV_humanitarian_settings%20(1).pdf

1- Sexual harassment that includes rape, sodomy, attempted rape, sexual abuse, child sex abuse, forced prostitution (willing – but involuntary), and child prostitution;
2- Emotional, mental and social: verbal / emotional abuse, humiliation, discrimination among workers, and deprivation of opportunities and /or services;
3- Economic: salaries and opportunities deprivation and harmful traditional practices.

Given the fact that all workers will adhere to the code of conduct, this impacts tends to be of moderate severity

The impacts GBV will be, local, and of **moderate** severity

5.2.2.8 Land acquisition

With regard to the land, it is anticipated to obtain lands for the following:

- If storage of equipment and construction materials is needed, the contractor will lease lands in order to store the construction materials
- Area of land is needed to be used for storage purposes in the construction site. The contractor will rent site storage areas in order to store the equipment and excavation tools, and temporary equipment for workers' services.

The above mentioned lands will entail no involuntary resettlement.

The impact of land acquisition is temporary, local, and of **minor** significance.

5.3 Summary of Positive Potential Impacts during the Operation Phase

The project is expected to have potential positive environmental and social impacts, as follows:

5.3.1 Positive Environmental Impacts

- Reducing air pollution and GHG emissions caused by operating diesel and benzene generators, as the residents will rely on the electricity distribution network
- Cutting down the noise level resulting from those generators.
- Reducing dust (PM10, PM2.5) as a consequence of roads paving
- Reducing stagnant water ponds created in rainy seasons as a result of constructing a storm water drain system

5.3.2 Positive Social Impacts

The project has significant positive economic impacts during the operational phase. These impacts can be divided into local and national impacts:

- The project will provide employment opportunities in the operation phase for the residents surrounding the project. The employment opportunities will be about 50 jobs on average in order to maintain the OHTL, storm water drainage network, and streets. The State will benefit from these jobs in the form of income taxes collected.
- Providing employment opportunities for workers in the field of workers' transportation who will contribute to the transport of labor.

- There will be a supply chain; a kind of support services to be provided for the project, assistance activities and supply activities for equipment, services, food and health care, all of which can benefit the community.
- Enhancement of the electricity distribution and street lighting networks in Al-Samah and Yarimcha districts;
- Enhancement of the storm water drainage network and streets rehabilitation in east side of Al Samah district;
- Enhancement of the storm water drainage network and streets paving in the west side of Al Samah district;
- As a result of above mentioned projects, the living conditions of the community people will be significantly improved.
- Improved accessibility of people, goods and services to Al-Samah and Yarimcha areas
- Improved safety conditions due to provision of reliable electricity service
- Provision of better and enhanced services in hospitals and fewer casualties (e.g. babies in incubators).

5.4 Summary of Negative Potential Impacts during the Operation Phase

5.4.1 Negative Environmental Impacts

5.4.1.1 Noise

Maintenance and repair work and the movement of the construction equipment or vehicles associated with it would produce noise.

Impact Significance:

However, this impact is going to be a short-term impact during the maintenance activity only and its spatial extent is going to be local scale impact in the exact area of the maintenance/repair activity.

Accordingly, the impact is expected to be of Minor Significance

Rehabilitation of the roads will lead to an increase in the traffic; consequently, elevating the noise and vibration level produced by traffic.

Impact Significance:

This is a long term impact; however, it is taken into consideration that the roads that are planned to be rehabilitated in the project are not main roads; therefore, the traffic load is not expected to increase significantly.

Accordingly, the impact is expected to be of Moderate significance

5.4.1.2 Air Quality

The traffic is expected to increase on the roads after rehabilitation, which will cause an increase in the gaseous emissions (SO_x, NO_x, CO, VOCs, etc.).

Impact Significance:

This is a long term impact; however, it is taken into consideration that the roads that are planned to be rehabilitated in the project are internal roads, not main roads; therefore, the traffic load is not expected to increase significantly.

Accordingly, the impact is expected to be of Moderate significance

- Additionally, maintenance activities is going lead to an increase in the fugitive dust emissions (PM10, PM2.5) and gaseous emissions (SO_x, NO_x, CO, VOCs, etc.) produced by the construction machinery and vehicles.

Impact Significance:

However, this is a short-term impact that will take place during the maintenance activity only and its spatial extent is going to be local scale in the exact area of the activity.

Accordingly, the impact is expected to be Insignificant

5.4.1.3 Waste Generation and Hazardous Materials

There shall be different types of wastes generated during the operation phase of the project resulting either from maintenance, repair and/ or replacement activities. Among these wastes are the following:

- Hazardous Waste; Asphalt spills, concrete spills and waste cables that maybe be replaced along the distribution lines. Some of these cables may be covered with PVC insulators, which, if burned, cause harmful emissions including dioxins. Accordingly, waste cables could be of high risk if PVC cables were disposed in open dumps, where it could be exposed to open burning.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be made of inert materials that does not cause high risk in disposal/recycling procedures.
- Replaced Asphalt
- Domestic waste from the workers

Impact Significance

Non-hazardous wastes which include domestic waste, and scrap are associated with relatively low environmental risks. Yet, certain waste management procedures should be considered in order to avoid situations where scrap occupies large areas of land and causes aesthetic and land-use negative impacts.

On the other hand, hazardous wastes will be mainly generated only in the location of the maintenance or replacement. Therefore, it is expected that the amount of generated hazardous waste will not be significant. Therefore, the impact is considered of Moderate significance. The ESMP includes measures for establishing temporary waste accumulation areas (WAA) for scrap and domestic waste at the project site and keeping the tidiness and cleanliness of these storage areas until scrap is disposed in the landfills or waste disposal facilities as detailed in the ESMP.

Accordingly, the impact is expected to be of Moderate significance

5.4.2 Negative Social Impacts

5.4.2.1 Traffic Flow (disruption of local and regional traffic)

The maintenance work of the OHDL will be limited to the OHDL site. It will not intersect with the main streets. Additionally, for road maintenance, activities are limited to specific parts and not anticipated to be carried out on bigger scale. Therefore, the traffic impacts will be of no significance.

Traffic impacts are considered **insignificant** during operation.

5.4.2.2 Effect of the Electromagnetic Fields (EMF)

OHTL generate electromagnetic fields around the conductors, the intensity of such fields is proportional with the line voltage and electric current, which changes in strength over time as the demand for electricity fluctuates. There are some concerns that EMFs could cause health impacts to the general public by prolonged exposure. EMFs have been considered by the International Agency for Research on Cancer (IARC) as possible carcinogenic, this classification was based on some evidences; however, there is no agreement among the scientific community about certain effects of EMFs.

In order to maintain safety of the general public and minimize exposure to EMFs some laws and guidelines require maintaining a suitable Right of Way (ROW) distance so that the EMFs would effectively attenuate at the edge of this ROW. The Iraqi Electricity Law (53/ 2017 indicates that the guidance ROW distance for transmission lines is 25 meters for high voltages from the center of the transmission

The ICNIRP has set a guideline figure that public exposure to EMF should not exceed 830 mG and occupation exposure should not exceed 4,150mG, these figures for electric fields are 4.2 and 8.3 kV/m for public and occupational exposure respectively. By fixing a ROW distance of 50 meters (divided into 25 meters each from the Centre of the transmission lines (for 220 kV OHTL) the impact of EMFs on the inhabitants is expected to be moderate, which will be minimized to minor, if mitigations are applied as stated in the ESMP.

Impacts related to EMF are considered to be of **moderate** significance.

5.4.2.3 Occupational Health & Safety

Occupational health and safety -related impacts are of moderate significance, because of the limited number of workers and strict occupational health and safety procedures. The proper management of odor and noise will put limitation to the impacts.

Impacts related to occupational health and safety are considered to be of **moderate** significance.

5.4.2.4 Community health and safety

During the operational phase the potential impacts on the safety of the community will be reduced due to the low traffic density and the absence of any kind of expatriate labor.

There will be limited number of maintenance laborers who will be recruited from the Project area of influence. Therefore, the probability of transmission of diseases to community people is limited.

Additionally, there will be no activities on the roads and below the OHTL. Therefore, the impact tends to be of minor severity.

Impacts related to community health and safety are considered to be of **minor** significance

5.4.2.5 Child labor

There will be no child labor during operation phase due to the project reliance on the permanent workers who must have valid recruitment documents i.e. ID, educational certificates…etc.

The municipality staff are fully aware that recruiting people below 18 years old is prohibited in all rehabilitation projects. ReFAATO will focus on applying rigid monitoring of recruitment process.

Impacts related to child labor are considered to be **insignificant**.

5.4.2.6 Visual and landscape impacts

As the project will enhance streets and the OHTL in the area of influence, visual landscape impacts tend to be positive. Recently, all project sites suffer due to bad street conditions and unfavorable OHTL view. The Project will modify the OHTL and the street conditions.

Impacts pertaining to visual intrusion are considered to be **insignificant**.

5.4.2.7 Cultural heritage and monuments

There are no expected impacts on cultural heritage sites and monuments during the project operation phase.

Impacts on cultural heritage are considered to be **insignificant**

5.4.2.8 Land acquisition

During the operation phase, maintenance equipment will not acquire any land as no storage areas will be required. Therefore, there will be no impacts related to the acquisition of land in the operational phase.

Impacts of land acquisition are considered to be **insignificant**

5.4.2.9 Infrastructure

There will be no impacts on any infrastructure within the project sites. However, there will be significant enhancement in street conditions and OHTL and the drain management network which is one of the most important infrastructures in the project site

Impacts pertaining to enhancement of infrastructure tend to be positive

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Assessment of Impacts in the Pre-construction and Construction Phases							
Noise	Noise and vibration during site preparation, construction, installation and noise generated from construction trucks and equipment	**Very Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Air Quality	• Gaseous emissions (SO_x, NO_x, CO, VOCs, etc.) from engines of construction machinery and equipment. • Dust emissions (PM10, PM2.5) due to earthwork and movement of construction trucks and equipment on unpaved roads	**Very Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Waste Generation and Hazardous Materials	• Improper handling and storage of hazardous and non- hazardous waste has adverse environmental impacts • Wastes generated during construction activities comprise: - Excavated soil. - Trimmings of steel and pipes. - Cut-off trees and vegetation - Metals, wood, cement sacks, sand and gravel, cut off cables, garbage from daily activities of workers. - Wasted or faulted materials including conductors and insulators - Solid wastes and domestic wastewater from construction offices - Hazardous wastes, such as spilled oils from the operation and maintenance of machinery, empty containers, paints, concrete washout water, concrete spills etc.	**Very Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Soil Contamination	• Possibility of Soil/subsoil contamination due to accidental spills and leaks from construction equipment • Improper discharge of domestic wastewater from construction offices	**Very Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Soil Erosion	• Increased soil erosion at the project site due to excavation work, especially during rainy seasons	**Very Low**	**Low**	**Moderate**	**Low**	**Medium**	**Minor**
Water Resources	**Contamination** • Improper disposal of debris or construction wastes on river banks • Improper discharge of domestic wastewater from construction offices into water bodies • Underground water contamination by uncontrolled dumping of waste	**N**	**N**	**Very Low**	**Very Low**	**Low**	**Insignificant**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
	Consumption • An increase in the water consumption for construction purposes, such as concrete mixes, dust suppression and washing concrete mixers. • An increase in the water consumption for domestic use by workers. The drinking water consumption rate is 50 litres per person per day supplied by the water supply network in the district.	**Very Low**	**Low**	**Low**	**Low**	**Medium**	**Minor**
Energy Consumption	• Consumption of fossil fuels (mainly diesel) for the construction vehicles and machinery and for running generators. • Fossil energy is non-renewable and its excessive use may have serious environmental implications on its availability, price and sustainability.	**Very Low**	**Low**	**Low**	**Low**	**Medium**	**Minor**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Flora and Fauna	• Flora and fauna species are not classified as rare or endangered. Those species are common and abandoned in many locations. • The project is a rehabilitation of an already existing network, so the project activities are not expected to destroy terrestrial habitats of any species	**Very Low**	**Very Low**	**Very Low**	**Very Low**	**Low**	**Insignificant**
Extraction of Natural Resources	• Extraction of raw materials, such as gravel and sand from quarries has a negative impact on the availability of those natural resources, • The extraction process might disturb the land scape of the source of the materials and the natural habitat.	**Very Low**	**Low**	**Low**	**Low**	**Medium**	**Minor**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Occupational Health and Safety	Construction activities are among the most dangerous and exposed to accidents in any work environment. Exposure to construction site hazards can expose workers to injuries. To avoid such situations, the company must identify and recognize all the risks that can be encountered during normal work. According to standards, each worker must have accurate information about their vulnerability to hazards or injuries in the workplace.	**Very High**	**Moderate**	**Moderate**	**High**	**Medium**	**Major**
Community Health and Safety	• The project workers might transmit diseases to local communities. • The project vehicles and construction activities might result in injuries among community pedestrians who use the streets. • Additionally, there might be dust emissions that affect people with allergy	**High**	**Moderate**	**Moderate**	**Moderate**	**Medium**	**Moderate**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Traffic flow	Traffic flow will be affected due to the rehabilitation of streets and mobility of equipment and construction materials	**Very low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Child labor	**C**hild labor tend to be high as Iraq recently enacted Law 37/2015 (the Iraqi Labor Law). Chapter 3 of this Law states that the minimum age for employment is 15 years old.	**High**	**Moderate**	**High**	**High**	**Medium**	**Major**
Visual and landscape	For construction and excavation works, the visual impacts are temporary, mainly from over-ground storage of drilling products and raw materials (cement bags, concrete mixers, construction waste, etc.).	**Low**	**Low**	**Low**	**Low**	**Low**	**Minor**
Cultural heritage	Iraq is well-known for its long history. Therefore, there is always a high probability to find objects of cultural value. Additionally, there are a vast number of mosques and graveyards as well.	**Low**	**Low**	**Low**	**Low**	**Low**	**Minor**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Infrastructure and underground utility	• Breaking a water supply pipe may result in cutting the supply to a number of residential units, which may lead residents to use other sources of water which may be either expensive or unsafe. • Damaging sanitary pipes, electricity underground cables and water pipelines result in severe disturbance to community people. The time needed to resolve problems with damaged utilities is relatively short (no more than 4-8 hours).	**Medium**	**Low**	**Low**	**Medium**	**Low**	**Minor**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Temporary labor influx	The contractor/s rely on recruiting workers and technicians during the pre-construction and construction works. The total number of workers is estimated to be about 45-60 workers in each project site according to the nature and type of sub-project. Additionally, the contractor/s will have different working sites. Construction workers will be divided into teams. They might work in parallel or in sequence. Therefore, the number of workers varies according to the size of the work in each area. Consequently, the impact differs and varies according to each area. The temporary labor influx and presence of additional workers may have impacts on the project areas in terms of: • Risk of social conflict • Increase risk of illicit behavior and crime • Risk of transmission of communicable diseases • Cause prices inflation	**Moderate**	**Moderate**	**Moderate**	**Moderate**	**Medium**	**Moderate**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Gender-based violence	• There is a probability of having impacts related to gender-based violence issues i.e. sexual harassment, discrimination and deprivation of opportunities and economic alienation	**Moderate**	**Moderate**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Land acquisition	• Storage of equipment and construction materials. The contractor will lease lands in order to store the construction materials • Temporary site storage areas in the street. The contractor will rent site storage areas in order to store the equipment and excavation tools, in addition, temporary equipment for workers' services. As well as, the contractor will coordinate with the district in order to provision sanitation and potable water services. • The above mentioned lands will entail no involuntary resettlement.	**Low**	**Low**	**Low**	**Low**	**Medium**	**Minor**
Assessment of Impacts in the Operation Phase							

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Noise	• Maintenance and repair work and the movement of the equipment or vehicles associated with it will produce noise and cause vibrations to local community and workers	**Very Low**	**Very Low**	**Low**	**Low**	**Medium**	**Minor**
	• The rehabilitation of the roads will lead to an increase in the traffic; consequently, increasing the noise produced by the traffic.	**High**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Air Quality	• Increase in the gaseous emissions (SOx, NOx, CO, VOCs, etc.) due to increase in the traffic load	**High**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
	• Fugitive dust (PM10, PM2.5) and gaseous emissions (SOx, NOx, CO, VOCs, etc.) will be generated during maintenance activities by the construction machinery and vehicles.	**Very Low**	**Very Low**	**Low**	**Low**	**Low**	**Insignificant**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Waste Generation and Hazardous Materials	Wastes are generated during the operation phase resulting from maintenance, repair and replacement activities: • Hazardous wastes: Asphalt spills, concrete spills, replaced waste cables. Some of these cables may be covered with PVC insulators • Scrap fittings, insulators, cross arms, conductors, etc., which are expected to be made of inert materials that does not cause high risk in disposal/recycling procedures.	**Very Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Occupational health and safety	Occupational health and safety -related impacts are of moderate significance, because of the limited number of workers and strict occupational health and safety procedures. The proper management of odor and noise will put limitation to the impacts.	**Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Community health and safety	During the operational phase the potential impacts on the safety of the community will be reduced due to the low traffic density and the absence of any kind of expatriate labor.	**Very low**	**Very low**	**Low**	**Low**	**Medium**	**Minor**
Electromagnetic field impacts (only applicable for the OHDL)	OHDL generates electromagnetic fields around the conductors, the intensity of such fields is proportional with the line voltage and electric current which changes in strength over time as the demand for electricity fluctuates. There are some concerns that EMFs could cause health impacts to the general public by prolonged exposure. EMFs have been considered by the International Agency for Research on Cancer (IARC) as possible carcinogenic, this classification was based on some evidences; however, there is no agreement among the scientific community about certain effects of EMFs.	**Moderate**	**Moderate**	**Moderate**	**Moderate**	**Medium**	**Moderate**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Traffic flow	The maintenance work of the OHDL will be limited to the OHDL site. It will not intersect with the main streets. Additionally, for road maintenance activities is limited to specific parts and not anticipated to be carried out on bigger scale. Therefore, the traffic impacts will be of no significance.						**Insignificant**
Child labor	Recruitment of children during operation will not valid as the recruited people will be of permanent nature. Therefore, they should submit formal documents that verify their age. Additionally, the municipality should be informed that persons below 18 can't be recruited.						**Insignificant**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Visual and landscape	As the project will enhance streets and the Overhead distribution network (OHDL) in the area of influence, visual landscape impacts tend to be positive. Recently, all project sites suffer due to bad street conditions and unfavorable OHDL view. The Project will modify the OHDL and the street conditions.						**Insignificant**
Cultural heritage	There are no expected impacts on cultural heritage sites and monuments during the project operation phase.						**Insignificant**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Infrastructure and underground utility	There will be no impacts on any infrastructure within the project sites. However, there will be significant enhancement in street conditions and OHDL and the rain management network which is one of the most important infrastructures in the project site						**Insignificant**
Temporary labor influx and Gender-based violence	Given the limited number of workers during operation and the majority will be from the project sites, labor influx impacts tend to be of no significance						**Insignificant**

Table 5-1 Potential Environmental and Social	Potential Impacts	Duration	Spatial	Magnitude	Basic Impact Index	Receptor Categorization	Impact Significance
Land acquisition	During the operation phase, maintenance equipment will not acquire any land as no storage areas will be required. Therefore, there will be no impacts related to the acquisition of land in the operational phase.						**Insignificant**

6. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.1 Overview

The objective of the Environmental and Social Management Plan (ESMP) is to outline a mechanism for mitigating potential negative impacts which the project imposes on the environment and the residents of the project areas. Additionally, the ESMP is a vital tool that is utilized for monitoring the application and performance of the proposed mitigation measures. The ESMP identifies roles and responsibilities of different stakeholders for the proper implementation and efficient monitoring of the mitigation actions. Table 6-1 Environmental and Social Management Plan for the Pre-construction and Construction Phases, Table 6-2 Environmental and Social Monitoring Plan for the Preconstruction and the Construction Phases, Table 6-3 Environmental and Social Management Plan during the Operation Phase and Table 6-4 Environmental and Social Monitoring Plan during the Operation Phase. The EHS General Guidelines[35] and the Industry Sector Guidelines (Electric Power Transmission and Distribution[36], and Construction Materials Extraction[37]) of the WBG should be used as a guide for implementing the mitigation measures relevant to the project activities.

[35] https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p

[36] https://www.ifc.org/wps/wcm/connect/7b65ce6b-129d-4634-99dc-12f85c0674b3/Final%2B-%2BElectric%2BTransmission%2Band%2BDistribution.pdf?MOD=AJPERES&CVID=jqeI4Rs&id=1323162154847

[37] http://documents.worldbank.org/curated/en/222201490081035541/Environmental-health-and-safety-guidelines-for-construction-materials-extraction

6.2 Environmental and Social Management Plan for the Pre-construction and Construction Phases

Table 6-1 Environmental and Social Management Plan for the Pre-construction and Construction Phases

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Noise	Noise disturbance to local community and workers	• Provide ear muffs to construction workers located near noisy machines • Organize working hours so that noise exposure to workers will be minimized • Coordinate and inform residents at the nearby sensitive receptors about the peak time and hours for construction activities. • Limit construction activities to daytime (not between 8 p.m. and 7 a.m., or as agreed with public and authorities) • Adopt a policy of switching off machinery and equipment when not in use	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractor costs
Air Quality	Dust caused by excavation	• Spraying soil before excavation in loose sandy soil	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractor costs
	Dust generated from the movement of the trucks and construction machinery on unpaved roads	• Minimize unnecessary journeys or equipment used. • Impose speed limits	Site engineer /contractor	Resident Engineer- PMT	Site supervision	No cost

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
	Windblown dust from storage areas of raw materials such as sand, gravel and cement	• Temporary storage areas on site shall be allocated in a place protected from the wind • Water storage areas, if applicable	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractor costs
	Dust caused by transportation of raw materials	• Wet or cover truck load	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractor costs
	Gaseous emissions from engines of construction machinery	• Use machines with high efficiency engines, effective combustion rates and low emissions. • Adopt a policy of switching off machinery and equipment when not in use (idle mode). • Apply regular maintenance to the machinery	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractor costs
Waste Generation and Hazardous Materials	Improper handling and storage of construction waste and domestic waste, generated from the construction offices	• Banning open and uncontrolled burning of waste • Allocate a Waste Accumulation Area (WAA) within the construction site for temporary storage of construction waste. • The WAA has to be protected from rain, and from washing out. For instance, it could be a sufficiently deep pit covered with impermeable material, and clearly marked to avoid intrusion from people and machinery	Site engineer /contractor	Resident Engineer- PMT	• Review local authority approvals • Site supervision • Occasional inspection and auditing of the WAA	Contractor costs

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		• Keep tidiness and cleanliness of the WAA • Wastes shall be ultimately disposed in the nearest designated disposal site (landfill) by a licensed contractor				
	• Hazardous wastes, such as fuel, solvents, paints, concrete washout water, spilled oils from the operation and maintenance of machinery, etc.	• Proper handling of lubricants, fuel and solvents and provide secured storage • Ensure proper loading of fuel and maintenance of equipment • Keep hazardous waste in marked leak proof containers and temporarily dispose in a secured area for hazardous waste in the WAA • Finally, dispose hazardous waste in a permitted waste recovery facility by a licensed contractor • Collect and retain all the concrete washout water and solids in leak proof containers, so that this caustic material does not reach the soil surface and then migrate to surface waters, storm water drains or into the ground water • Separate solids (gravel and sand) and liquid of concrete wash water using filters				

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		• Re-use concrete wash water in washing the concrete mixing equipment or in the concrete mix				
Soil Contamination	• Possibility of accidental spills and leaks from construction equipment • Improper handling of solid waste • Seepage of concrete wash water into the soil, underground water and storm water drains, which discharge in Tigris, causing its pollution. • Improper discharge of domestic sewage from construction offices • Improper handling and	• Setting and applying a Waste Management Plan to prevent pollution of the soil • Temporarily dispose solid waste in the WAA. The WAA has to be protected from washing out, it could be a sufficiently deep pit covered with impermeable material • Hazardous waste, such as spent engine oil, and nonhazardous waste must be temporarily disposed in the designated WAA on-site and then finally disposed in a licensed disposal facility by a licensed contractor • Organize and cover material storage areas • Collect and retain all the concrete washout water and solids in leak proof containers, so that this caustic material does not reach the soil surface and then migrate to surface waters, storm water drains or into the ground water The construction contractor shall provide portable toilet cabinets on site, to be equipped with an external tank for sewage storage in	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractors Costs

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
	storage of construction materials	order to avoid improper disposal of sanitary waste.				
Soil erosion	Increased soil erosion at the project site due to excavation work, especially during rainy seasons	• Balancing of cut and fill. • Design to prevent soil erosion and maintain slope stability. • Construction in the dry season. • Protection of soil surfaces during construction.	Site engineer /contractor	Resident Engineer- PMT	• Site supervision	Contractors costs
Water Resources Consumption	Increase in the water consumption, as follows: • Construction purposes, such as concrete mixes, dust suppression and washing concrete mixers. • Domestic use by workers, with a rate of 50 liters per person per day supplied by the water supply network in the district.	• The contractor shall ensure that water is used efficiently at the site by sensitizing the construction staff to avoid irresponsible water usage, hence minimize pressure on the local water resource	Site engineer /contractor	Resident Engineer- PMT	Site supervision	Contractors Costs

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Energy Consumption	• Consumption of fossil fuels for the construction vehicles and machinery and generators • Excessive use may have serious environmental implications on its availability, price and sustainability	• Proper planning of transportation of materials to ensure optimum consumption of fossil fuels (diesel, petrol) • Use machines with high efficiency engines • Adopt a policy of switching off machinery and equipment when not in use (idle mode). • Apply regular maintenance to the machinery • Monitor energy use during construction and set targets for reduction of energy use	Site engineer /contractor	Resident Engineer- PMT	• Site supervision	Contractors costs
Extraction of Natural Resources	Extraction of natural materials, such as sand and gravel from borrow pits, imposes a negative impact on their availability and sustainability	• Deciding the quantities according to accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. • Minimizing damage or loss (by run-off, wind, etc.) of materials at the construction site by covering the storage areas to avoid extracting more materials • Consider the reuse of construction natural materials and use of recycled materials.	Site engineer /contractor	Resident Engineer- PMT	Site supervision Review reports	Contractors Costs

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Work force	**Occupational health and safety**	• The Contractor shall prepare and adopt an Occupational Health and Safety Plan (OHSP) during the construction phase. • The developed OHSP should be prepared in full compliance with World Bank Group Environmental, Health & Safety Guidelines [38] • The contractual agreement with the contractor/s should include rigid commitments to apply the OHSP that should be prepared in full compliance with the WB EHS requirements. • The minimum elements to be included in the EHS plan are as follows: o General Facility Design and Operation o Communication and Training o Physical Hazards o Chemical Hazards o Biological Hazards o Radiological Hazards o Personal Protective Equipment (PPE) o Special Hazard Environments o Monitoring	Contractor	Resident Engineer-PMT	• Periodic reports • Periodic meetings with the community people	Contractor's cost

[38] https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Community	**Community health and safety**	• Community health and safety guidelines should be followed on the access roads to be used by the sub-project's vehicles. • A traffic plan should be developed along project sites to provide the maximum safety to the population and project personnel. • People with disability and school children should be provided with safe access roads to their schools and commercial areas, particularly, as the project will dig streets. Safe access roads can be provided with lights in order to avoid falls of pedestrians during night. Safe access roads also should consider avoiding passing under the electricity distribution network. • The contractor should design proper access roads that enable old people, people with disability and children to cross roads safely. •	Contractor	Resident Engineer-PMT	Develop a traffic plan Monitoring report on vehicles	Within contractor cost
Community	**Traffic flow**	• Provide information about the roads and traffic that will be closed during construction • Determine the maximum speed within the project site • Restrict the movement of large vehicles (trucks) to avoid rush hours • Ensure vehicle safety and regular maintenance	Contractor	Resident Engineer-PMT	Accidents log Community grievance mechanism	Contractor's cost

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Community	**Child labor**	• In the contractual agreement, clear definition of child should be inserted. The child should be defined as all persons less than 18 years old. • Rigid terms should be written in the contractor agreement to prohibit recruitment of children below 18	Contractor	Resident Engineer-PMT	Site investigations	Within contractor cost
Community	**Cultural heritage**	All chance find procedures will be applied	Site engineer	Resident Engineer-PMT	Reports about antiquities found	Contractors' cost
Community	**Infrastructure and underground utility**	• Coordination with departments of potable water, wastewater, electricity, and telecom authorities to obtain maps/ data on underground utilities, whenever available • Collection of most accurate maps for underground utilities and infrastructure routes from Ninawa Governorate and asking for site markings, if available, prior to commencing the works. • Boreholes to locate underground utilities before using mechanical excavation.	Site engineer	Resident Engineer-PMT	Keep records of any infrastructure accidents Review periodic reports about infrastructure accidents	Contractors' cost

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		• In case an underground utility and infrastructure pipe has been damaged, standard procedures should be followed, in addition to preparing a documentation report for the accident.				
Community	**Temporary labor influx and Gender-based violence**	In order to minimize impacts pertaining to labor influx the following should be thoroughly implemented: • Preparation of appropriate code of conduct that stipulates the commitment of labor towards community groups and behaviors that should be avoided • All workers should be trained on the code of conduct. • Code of conduct to be signed by sub-contractor • Code of conduct induction to be done every 2 weeks for the recurrent workers and the new comers before starting work. • Apply the full requirements related to operating the grievance mechanism including anonymous channels • Raising awareness of the local populations about the project commitment towards communities' and the measures taken for that through public consultation and focus group discussions	Site engineer	Resident Engineer-PMT	Site visit Monthly reporting GRM Meetings with surrounding communities	Contractors' cost

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		• Apply penalties to workers violating the code of conduct				

6.3 Environmental and Social Monitoring Plan for the Preconstruction and the Construction Phases

Table 6-2 Environmental and Social Monitoring Plan for the Preconstruction and the Construction Phases

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Noise	Increased noise and vibration levels	Noise intensity and vibration levels	PMT resident engineer and Mosul municipality	• Twice during the project • Upon receiving a complaint	• Construction site, • Nearest houses • Temporary offices	• Measuring and monitoring noise and vibration levels by a certified laboratory • Safety supervisor shall ensure all workers use the protective equipment • Equipment and trucks maintenance report	Expenses included in the contract cost

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Air Quality	Increased air emissions	• Dust particulates • Gaseous Emissions	PMT resident engineer and Mosul municipality	• Twice during the project (measurement) • During materials delivery, loading and unloading (visual inspection)	• Construction site and surrounding area • Transport route	• Measuring dust and gaseous emissions by certified lab • Visual inspection • Reviewing equipment and trucks maintenance report • Supervision	Expenses included in the contract cost
Waste Generation and Hazardous Materials	Improper handling and storage of construction waste and domestic waste generated from the construction offices	• Disposal of waste in the designated waste area (WAA) • Cleanliness of the construction site	PMT resident engineer and Mosul municipality	Quarterly Reporting	• WAA • Construction Site	• Inspection and recording of items disposed in the WAA • Inspection of cleanliness of the construction site and the handling process of waste	Expenses included in the contract cost

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Soil Contamination	• Possibility of accidental spills and leaks from construction equipment • Improper handling of construction and domestic waste • Improper handling and storage of construction material	Water and soil quality (suspended solids, oil and grease)	PMT resident engineer and Mosul municipality	• Twice during the construction phase • During material delivery • In the event of rainfall	• WAA • Materials storage areas, • Runoff from site wash down areas of equipment	• Visual observation • Recording and documenting spillage	Expenses included in the contract cost
Soil Erosion	Increased soil erosion at the project site due to excavation work, especially during rainy seasons	• Soil surface • Stability of slope • Balanced cut & fill	PMT resident engineer and Mosul municipality	During excavation work	Construction site	Visual inspection	Expenses included in the contract cost
Water Resources Consumption	Increase in the water consumption	Quantity consumed	PMT resident engineer and Mosul municipality	Twice during the construction phase	Construction site	Record and monitor quantities	Expenses included in the contract cost

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Energy Consumption	• Consumption of fossil fuels for the construction vehicles, machinery and generators • Excessive use may have serious environmental implications on its availability, price and sustainability	Quantity of fossil fuels utilized	PMT resident engineer and Mosul municipality	Twice during the construction phase	Construction site	Record and monitor quantities	Expenses included in the contract cost
Extraction of Natural Resources	Extraction of natural resources, such as sand and gravel may impact their quantities and sustainability of the source (borrow pit)	• Quantities actually extracted Vs. quantities planned to be extracted • ESMP and community approval	PMT resident engineer and Mosul municipality	Before exploitation/ work begins	Sand & gravel borrow pits	• Documents and quantities inspection/ consultation	Expenses included in the contract cost

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Community	• Traffic flow	• Comments and notifications from Traffic Department • Complaints raised by community people	• PMT resident engineer and Mosul municipality	• Once a month	• Site visit and office work	• Monthly reports and grievance log	• Sub-project owner's management costs
Work force	Occupational health and safety	• Regular reporting of any accidents, as well as records and reports on health, safety and welfare of workers • Continuous monitoring of all hazardous events. • Regular inspection of workers against pathogenic agents and provision of immunization when needed	PMT resident engineer and Mosul municipality	Once a month	Site visit and office work	Monthly reports and grievance log	Sub-project owner's management costs

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Community	Community health and safety	The monitoring of occupational health and safety will be intensively presented in the OHS manual to be implemented during operation phase	PMT resident engineer and Mosul municipality	Once a month	Site visit and office work	Monthly reports and grievance log	Sub-project owner's management costs
Community	Child labor	The monitoring of child labor will be intensively presented in the OHS manual to be implemented during operation phase	PMT resident engineer and Mosul municipality	Once a month	Site visit and office work	Monthly reports and grievance log	Sub-project owner's management costs
Community	Cultural heritage	Review documentation of chance find procedures	PMT resident engineer and Mosul municipality	Upon finding any cultural heritage	Site visit and office work	Monthly reports	Sub-project owner's management costs
Community	**Infrastructure and underground utility**	Documentation of affected infrastructure and corrective procedures taken	PMT resident engineer and Mosul municipality	On quarterly basis	Site visit and office work	Periodic reports and grievance log	Sub-project owner's management costs

Receptor /EHS Aspect	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Community	**Temporary labor influx**	Complaints raised due to labor influx Corrective measures adopted	PMT resident engineer and Mosul municipality	On quarterly basis	Site visit and office work	Periodic reports and grievance log	Sub-project owner's management costs
Community	**Land acquisition**	Land lease contract Complaints raised due to land acquisition (if any)	PMT resident engineer and Mosul municipality	On quarterly basis	Site visit and office work	Periodic reports and grievance log	Sub-project owner's management costs

6.4 Environmental and Social Management Plan during the Operation Phase

Table 6-3 Environmental and Social Management Plan during the Operation Phase

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Noise	Noise & vibrations to local community and workers during maintenance and repair	• Provide ear muffs to construction workers located near noisy machines • Organize working hours so that noise exposure to workers will be minimized • Coordinate and inform residents at the nearby sensitive receptors about the peak time and hours for construction activities. • Limit maintenance activities to daytime (not between 8 p.m. and 7 a.m., or as agreed with public and authorities) • Adopt a policy of switching off machinery and	Mosul municipality	Mosul municipality	Site supervision	Operation costs

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		equipment when not in use				
	Increased traffic after rehabilitation, elevates noise and vibration level	• Setting time restriction for trucks • Generally, smooth, well-maintained surfaces such as freshly laid asphalt without grooves and cracks will keep noise to a minimum. • Applying a bituminous surface layer over concrete roadways when they get worn over time, is effective in reducing frictional noise[39]. • Setting speed limits	Mosul municipality	Mosul municipality	Site supervision	Operation costs
Air Quality	Increase in the gaseous emissions (SOx, NOx, CO, VOCs, etc.) due to increase in the traffic load	• Enforcing the laws related to exhaust emissions from the vehicles	Mosul municipality	Mosul municipality	Site supervision	Operation costs

[39] http://siteresources.worldbank.org/INTTRANSPORT/Resources/336291-1107880869673/chap_16.pdf

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
Waste Generation and Hazardous Materials	Wastes (hazardous & non-hazardous) are generated during the operation phase resulting from maintenance, repair and replacement activities	• Temporary disposal of waste in the designated waste area on-site • After the work is done, dispose all the waste in the nearest landfill by a licensed contractor • Proper handling of lubricants, fuel and solvents and provide secured storage • Keep hazardous waste in marked leak proof containers and temporarily dispose in a secured area for hazardous waste on site • Collect all Hazardous waste and dispose in a licensed waste recovery facility by a licensed contractor	• Mosul municipality	• Mosul municipality	• Review local authority approvals • Site supervision	• Operation costs
Community	• Electromagnetic field	• Routes of OHDLs are designed so that	Mosul municipality	Mosul municipality		

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		maximum possible distances could be maintained between the lines and developed areas • A suitable ROW should be kept on both sides of power lines were no development buildings should be constructed. The Iraqi Electricity Law issued in 2017 article 14 indicated the guidance of RoW • Maintaining standard safety procedures for the electricity distribution network.				
Work force	Occupational health and safety	The sub-project owner will adhere to above mentioned occupational health and safety requirements as follows:	Mosul municipality	Mosul municipality	• Incidents and accidents reports • Site visit reports	Operation cost

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		• Maintain site security and safety. • Organization of work shifts and movement of trucks. • Develop occupational health and safety plan. • Develop emergency plans.				
Community	• Community health and safety	• Follow the mitigation measures mentioned earlier in section 7.1 • Provide a complaint mechanism for the community. • Conduct periodic community meetings to observe any concerns they may have. • Conduct periodic meetings with the Environmental	• Mosul municipality	• Mosul municipality	• Incidents and accidents reports • Site visit reports	Operation cost

Receptor/ EHS Aspect	Impact	Proposed mitigation measures	Responsibility for		Supervision method(s)	Estimated Cost
			Implementation	Supervision		
		Authority to monitor the quality of reducing the impacts of dust.				

6.5 Environmental and Social Monitoring Plan during the Operation Phase

Table 6-4 Environmental and Social Monitoring Plan during the Operation Phase

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Noise	• Noise & vibrations to local community and workers during maintenance and repair • Elevated noise and vibration levels due to increased traffic after rehabilitation	Noise intensity	Mosul Municipality	• During maintenance • Annual	Sensitive receptors and nearby houses in the project areas	Measuring and monitoring noise and vibration levels by a certified laboratory	Operation cost
Air Quality	Increase in the gaseous emissions due to increase in the traffic load	Gaseous emissions (SOx, NOx, CO, VOCs, etc.)	Mosul Municipality	• Annual	Sensitive receptors and nearby houses in the project areas	Measuring and monitoring gaseous emissions by a certified laboratory	Operation cost

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Waste Generation & Hazardous Materials	Wastes (hazardous & non-hazardous) are generated during the operation phase resulting from maintenance, repair and replacement activities	• Disposal of waste in the designated temporary waste area on-site and final disposal in the nearest landfill by a licensed contractor • Cleanliness of the project area	• Mosul Municipality	• During maintenance	Project Areas	Site supervision	Operation cost

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Community	• Exposure to EMF	EMF should be measured in different locations especially at the areas where sensitive receptors are located This monitoring should be undertaken by a specialized expert on quarterly basis. The detailed EMF monitoring plan will be better left to the EETC and local authorities to identify.	• Selected locations where developed areas are closest to transmission lines	• Quarterly, or as required	• Site investigation Measurements through EMF meter	• EMF Expert (OHDL operator)	• No cost

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Work force	• Occupational health and safety	• Regular reporting of any accidents, as well as records and reports on health, safety and welfare of workers • Continuous monitoring of all hazardous events. • Regular inspection of workers against pathogenic agents and provision of immunization when needed	• Component owner regional branch	• Bi-annual report	• Site visit and office work	• Biannual report and GRM	• Operation cost

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Community	• Community health and safety	• The monitoring of occupational health and safety will be intensively presented in the OHS manual to be implemented during operation phase	• Component owner regional branch	• Bi-annual report	• Site visit and office work	• Biannual report and GRM	• Operation cost

6.6 Institutional Framework

6.6.1 Environmental Management Structures

Roles and responsibilities of the ESMP are divided between the two entities below:

- The first entity is HSE unit at the Municipality of El Mosul City is the central level of the supervisory body for the Rehabilitation of the storm water drainage network and streets rehabilitation in the East and West sides of Al Samah district.
- The second entity is the Contractor who is responsible for full implementation of mitigation measures in full cooperation with the regional MoE and Municipality staff.

Structure organization mandates define who will be the responsible body for monitoring and management of various impacts.

6.6.2 Roles and responsibilities of ReFAATO

ReFAATO is responsible for designing and operationalizing the Environmental and Social safeguards frameworks during the Parent project preparation phase. Thereafter, ReFAATO will be responsible for monitoring the implementation of E&S safeguards policies requirements. ReFAATO responsibilities are as follows:

Table 6-5: ReFAATO Roles and Responsibilities

Responsibility	Description
Monitoring	• Monitor safeguard polices and technical aspects of the E&S as required by the WB • Periodic monitoring visits and oversight of the PMT and contractors performance related to E&S aspects
Report preparation	• Prepare adequate and fit for purposes templates and mechanisms that verify level of commitment with the safeguard polices implementation • Prepare the quarterly reports to be shared with the WB
Capacity building	• Make sure that the PMTs personnel are well equipped and qualified to perform their roles and responsibilities • Provide technical assistance to the PMTs on E&S safeguards (if needed) • Develop, organize and deliver environmental training programs and workshops for the staff of PMTs, and contractors; • Develop programs to build the capacity in the PMTs to enhance their environmental and social management and monitoring

	understanding and practices.
Coordination/consultation and information sharing	• Coordinate closely with the PMTs and develop a contact list that can be shared with various entities (if needed) • Hold regular review meetings with the environmental focal points of the PMTs; • Secure sufficient information to community people and enable them to actively participate in the process of planning and monitoring of project activities • Maintain active communication channels that enable community people to inform about their complaints and feedback • Provide guidelines on community participation in environmental and social monitoring to the PMTs.
Documents/reports revision	• Review all reports related to E&S i.e. Screening, Scoping, ESIA, ESMP, Checklists, etc. • Verify the practicality and applicability of all proposed mitigation measures and integrate them in the tender document.
Documentation	• Maintain full documentation of all reports submitted to the WB

6.6.3 Roles and responsibilities of Project Coordination Unit (PCU) under ReFAATO

- Coordinate with all ministries and stakeholders.
- Consolidate and disseminate all reports from the PMTs and reflect the work progress to higher officials.
- Coordinate all monitoring and assume responsibility for internal and external independent evaluations.
- Coordinate the citizen's engagement program.
- Coordinate the communications and sensitization program.
- Coordinate training activities and capacity building programs.
- Ensure compliance with all legal obligations and instruments.
- Participate in Bank support missions.

6.6.4 Roles and responsibilities of Project Management Teams (PMTs) and contractor

The PMTs will be directly responsible for planning, coordinating, monitoring, and evaluation of all activities including consultant selection, reporting, procurement and auditing, and payment authorization.

The PMTs in this subproject will be responsible for adopting the following procedures:

6.6.4.1 Compliance with World Bank safeguards

1. Preparing internal guidelines for the preparation, implementation, monitoring and reporting of environmental and social documents required by various safeguard instruments;
2. Reviewing, as applicable, ESMP and other safeguard documents prepared by consultants to ensure compliance with relevant safeguard policies of the National and the World Bank;
3. Providing recommendations to MoE management and other contractors accordingly and make necessary changes prior to submission of relevant documents to the World Bank – ensure consistency in the level of proficiency and presentation of the documentation;
4. Carrying out documentation review pertaining to environmental and social compliance (including bidding documents, reviews on-site, reports from contractors etc.) throughout project implementation;
5. Coordinating and facilitating the work of consultants engaged to carry out environmental and social impact assessments and resettlement planning and external monitoring of safeguard instruments implementation;
6. Accidents resulting in fatalities should be immediately reported to ReFAATO and the WB within 48 hours.

6.6.4.2 Monitoring and reporting

1. Conducting internal monitoring of the implementation of the environmental and social component of the ESMP in matters pertaining to timely payments and the provision of temporary measures to affected persons;
2. Contributing to project progress reports pertaining to overall implementation of environmental and social requirements of the project.

6.6.4.3 Communication with and responsiveness to targeted communities

1. Adhere to the designed community friendly grievance redress mechanism with clear and timely bound tiers and responsibilities and ensure dissemination on the local level. Develop quarterly grievance and redress report to be shared with MoE and the Municipality of Al Mosul City.
2. Conducting field visits to ensure that the established grievance redress mechanisms are functioning properly and that the individual projects are implemented in a socially sustainable manner;
3. Participate in the process of disbursing compensations and keep track record of the compensation process documentation if exists.
4. Reach out to local communities, including PAPs if exists, to raise awareness about the project and the implementation schedule.
5. Build the capacity and provide support to the field staff as needed.

6.6.5 Roles and responsibilities of the Contractor's Environmental Health and Safety (EHS) Officers

The Contractor who is responsible for full implementation of mitigation measures in full cooperation with the regional MoE and Municipality staff. The Contractor's mandates are as follows:

1. Ensure that workers comply to EHS manuals and procedures
2. Management of wastes generated
3. Management of liquid waste
4. Checking that handling of hazardous waste is done according to the requirements of the Environmental Law
5. Other tasks as outlined in ESM&MP
6. Daily reports are to be compiled and sent to the governorate EHS officers for preparation of monthly summary reports.

Monthly reports are sent to EHS officer at MoE and the municipality of Al Mosul for compilation into quarterly reports.

6.6.6 Required Actions

- Involvement of environmental and social officers during the design, costing, tendering, and construction phases would be advantageous (accomplished and the ToR is in place;
- Specifically, contractor should take steps to develop capacity of site engineers and HSE officers with specific courses focused on implementation of the ESMP detailed in this ESMP report.

6.6.7 Required Resources

The Mosul City municipality have relatively limited capacity to implement the environmental and social commitments and ESMP developed in full compliance with the WB requirements. Therefore, following are recommended training programs for the municipality staff and the site engineers to build their capacity for managing the project:

Table 6-6: Recommended Training Courses for Municipality staff and Site Engineers

Training course	Type of training	Particpating parties	Proposed Scheduling
Tailored training on Environmental Management and monitoring for the project	Class room + on job training	• Environmental Department staff of the municipality • Resident engineers	Before detailed design of the project
Sampling and measurements (Water resources)	On Job training	• Environmental Department staff of the municipality • Resident engineers	Prior to project implmentation
Occupational health and safety	Classroom + on Job training	• Environmental Department staff of the municipality • Resident engineers	Prior to project implmentation

Defensive driving and machinery operation safety	Classroom + on job training	• Drivers and operators	Periodical
Monitoring and evaluation (activities and tools)	Classroom + on Job training	• Environmental Department staff of the municipality • Resident engineers	Prior to project implmentation

Table 6-7 : Recommended Training Courses for Social Development Officers in the Muncipality

Training course	Type of training	Particpating Parties	Proposed Scheduling
WB operational policies **OP 4.12 with emphasis on involuntary actions and grievances**	One-day Workshop + on the job training	• Social Development Officers	• One workshop during the beginning of the project implementation
Communication Skills	Two days' Workshop + on the job training	• Social Development Officers	• One workshop during the beginning of the project implementation
Promotion of Awareness Raising Activities	Workshop + on the job training	• Social Development Officers	• Once before the project implementation • Refreshment course during the implementation of the project
Community Participation Tools	One-day Workshop + on the job training	• Social Development Officers	• One workshop during the beginning of the project implementation
Monitoring and Evaluation mechanisms (M&E)	Two days' Workshop + on the job training	• Social Development Officers • Project management unit	• One workshop during the beginning of the project implementation

6.7 Reporting

Reporting process will be implemented as follows:

1. **Reporting by ReFAATO to the WB:** Quarterly reports will be submitted to the WB. The main elements of these reports are:
    - Project implementation updates
    - Environmental & social risks and safeguards
    - Grievance and how they were managed
2. **Reporting by PMTs to ReFAATO:** PMTs are the implementing agencies. They have direct contacts with the site engineers and contractors. They will provide on a quarterly basis the same above mentioned elements.
3. **Reporting by Contractors/ site engineers to PMTs:** The contractors and site engineers maintain close eye on all project activities. Therefore, they will report to the PMTs on monthly basis. The contractors and site engineers' monthly performance report will include, environmental, social, occupational health and safety issues and the grievances received segregated by topic/ issue and how they were solved. Any support documents will be included as Annexes.

7. PUBLIC CONSULTATION AND PARTICIPATION INCLUDING SECTION ABOUT GRM

7.1 Introduction

The public consultation chapter aims to highlight the key consultation and community engagement activities conducted as well as their outcomes. In addition, the chapter outlines the key issues that were discussed during the consultation activities.

Throughout various consultation and engagement activities, the study team was able to properly document and record different reactions of the community and the governmental stakeholders towards the proposed project.

Consultation activities were conducted during the screening and data collection phase

The public consultation activities were conducted in full compliance with the World Bank procedures related to consultation and public disclosure (BP 17.50) that stipulate the fundamental engagement of community people and disclosure of information.

7.2 Consultation Objectives

The objectives of consultation activities are summarized as follows:

- Define potential project stakeholders and suggest their possible project roles;
- Disseminate information about the project to enable stakeholders to identify their concerns, needs, and recommendations;
- Listen to their comments, ideas and concerns, and record them for follow up;
- Document stakeholder feedback and enhance the ESIA accordingly;
- Identify the most effective outreach channels that support continuous dialogue with the community;
- Avoid any misconceptions about the project and manage expectations properly.

7.3 Stakeholder Identification and Analyses

The first step in the process of stakeholder engagement is stakeholder identification; that is, determining who the project stakeholders are and how they should be grouped. Annex IV presents the full list of identified stakeholders.

7.4 Consultation Methodology and Activities

The first Consultation activities occurred during the preparation of the site specific ESMP (first draft report) submitted to the WB in 2019. Consultation activities conducted were inserted in the first draft report that was presented to the bank. There was a sort of diversity between males and females of various groups. The total number was relatively limited (about 10 persons).

Figure 7-1: Meeting with community members

Figure 7-2: Meeting with educational staff

Figure 7-3: Meeting with a female employee

Figure 7-4: Meeting with traders

The above-mentioned consultation activities showed a high level of acceptance of the project activities among the various stakeholders. However, there was a necessity to supplement consultation activities in order to engage more women.

The second consultation process conducted during the preparation of the ESMP in December 2019 was dynamic and evolving; i.e. it adapted with the nature and expectations of the host community. The process also engaged the local leadership and the parties involved in the water and sanitation sector, industrial, and health activities, in order to reach out to various groups among the affected people. Consultation activities were carried out with the community people to identify their opinions, inquires, and concerns towards the project. Continuous information sharing activities were conducted daily with the community people.

7.4.1 Consultation outcomes

The Consultant was keen on including diversified groups of people in the consultation activities. Therefore, a local consultant was recruited to engage different groups. The table below summarizes the groups that were consulted:

Stakeholder Category	Consulted males	Consulted females	Date
The counselor of Ninawa governor		1	December 2019
Mosul municipality	1		December 2019
Electricity department Mosul	2		December 2019
Community people	4		December 2019
Educational facility	2	10	December 2019
NGO (Narkal)	2		December 2019
Young people	2		December 2019
Old people	1		December 2019
Total	16	11	

The community people, governmental and non-governmental entities that were engaged expressed their acceptance of the project. There was an overwhelming acceptance to renovating streets and rehabilitation of the distribution network. Below is a summary of the conducted activities:

Figure 7-5: Community member

Figure 7-6: Meeting with female teachers

Figure 7-7: NGO meeting

Figure 7-8: An engineer in El Mosel municipality

Figure 7-9: Meeting with the counselor of Ninawa governor for planning

Figure 7-10: Meeting with electricity department representatives

Table 7-1: Summary of the main results and how they were addressed in the study

Issue	Comments raised	How comments were addressed in the study
Project benefits	Services are the most important aspect for a citizen, and the provincial council, supports projects that provide services to citizens. Services are considered one of the most important programs focused on by state ministries.	Importance of the project to be included in section 8.
Community safety	The project will have a positive impact on women, as it will make it easier for them to move without fear of slipping in mud, contamination of their clothes, or serious injury. Teachers are asking to start the project as soon as possible. Rains affects the health and attendance of students to school	Importance of the project to be included in section 8.
Sequence of implementation	Please make sure to complete the installation of the storm drainage network first before tiling, so that the streets will not be demolished again.	This recommendation will be added to the mitigation section.
Role of electricity directorate	The Mosul Electricity Directorate can provide support by following up and facilitating the matter and coordinating with the competent authorities to complete and make this project a success.	Monitoring role should be added in the mitigation section No. 7
Role of NGO	The NGO has previous experience of conducting questionnaires and awareness campaigns on rationalizing water consumption and solid waste, where they targeted women. They also printed and distributed awareness brochures in this regard.	Community engagement subsection includes role of NGOs.

The summary of the consultation activities conducted is as follows:

- Almost all of the community members and governmental entities consulted were keen to have all project activities conducted immediately with no further delay as street conditions and electricity supply conditions were in an extremely deteriorated condition;
- Teachers were willing to act as an active communication channel that will share information with the parents of children;
- This project is considered as one of utmost important projects to vulnerable women and children. Women expressed their concerns about their children, as they might slip and fall on destroyed or muddy streets;
- The community people also expressed their willingness to be recruited in the project, as the unemployment rate is high;
- It is not anticipated to have any job opportunities for women during construction phase, as the majority of women residents are reluctant to work in projects of such nature;
- Various stakeholders were much in favor for the project as it will enhance street conditions and manage to rehabilitate electricity network

7.5 Disclosure activities

As soon as the site-specific ESMPs gets clearance from the World Bank and approval from the Ministry of Environment, the following disclosure procedures will be undertaken:

- A final report, in English and an Executive Summary in Arabic, will be published on the WB, EODP and Ministry of Electricity and Mosul Municipality websites.
- A copy of the ESMP report in English and a summary in Arabic will be made available in the MoE branch office in Ninawa Governorate. Additionally, an Arabic executive summary will be made available in the regional branch and the municipality Mosul.
- An A3 poster will be installed in the entrance of the municipality of Mosul informing about the results of the ESMP and the website link for the full ESMP study.
- It will be useful also to maintain leaflets of the project impacts, GRM and contact office in the regional branch.

7.6 Grievance Redressal Mechanism

7.6.1 GRM objectives

The objective of a grievance procedure is to ensure that all comments and complaints from any project stakeholder are considered and addressed in an appropriate and timely manner. The effective grievance management can help to:

- Identification, channeling and impartial, timely and effective resolution of issues related to the implementation of **Emergency Operation for Development Project** (EODP) and its additional fund (AF);

- Strengthening accountability and responsiveness towards beneficiaries, affected persons and the public regarding EODP and EODP AF implementation; and
- Serving as an important feedback and management mechanism for the PCU and PMTs to deduce challenges and risks for EODP AF implementation.

7.6.2 Communication channels for sharing information about GRM:

Due to the diversity of the context in different Governorates and the socioeconomic characteristics of the beneficiaries, the communication channels to receive grievances were locally tailored to address all petitioner's concerns and complaints.

A range of channels will be available for submission of feedback including complaint boxes that will be installed in locations that are easily accessible to the public, a free of charge phone line, regular mail, an email account, and even on the social media application WhatsApp. In addition, hard copies of GRM uptake forms will be available at the PMT offices and project site. The main GRM uptake channels are summarized in the table below.

Table 7-2:GRM uptake channels for submission of feedback

REFAATO	PMT	Sub-Project Engineers
▪ Email: grm.wb@refaato.iq ▪ Online complaint system: refaato.net/form/ ▪ REFAATO hotline: **80011111** GRM users can call between Sunday-Thursday from 10 AM to 2 PM	▪ Letters to the PCU and/or relevant PMTs ▪ Phone calls to PMTs using telephone or WhatsApp ▪ In-person feedback to resident engineers on sub project sites and documented in GRM uptake form	▪ Feedback boxes on sub project sites ▪ In-person feedback to resident engineers on sub project sites and PMTs and documented in GRM uptake form ▪ Contact: Engineer Fouad Saleh – Mobile number: +9647724261455

As stated above, REFAATO has an online complaint system, available at: refaato.net/form/. Furthermore, on a more local level, community people should be informed about the GRM using the snowball method, which enables the verbal exchange of information. Accordingly, the most effective outreach channels to do this verbal exchange is by:

In addition to the above-mentioned channels, the Presidency of the Council of Ministers - National Investment Commission avails an online complaint system.

7.6.3 Grievance tools

- Posting contact information for the sub project engineer/contractor, Project Management Team (PMT) GRM focal point and the Project Coordination Unit GRM focal point on visible sign boards on all sub project sites;
- Installation of complaint boxes on sub project sites by PMTs in locations that are easily accessible to the public;
- Availability of hard copies of EODP GRM brochures and the GRM uptake form at all PMT offices and at all subproject sites;
- Webpages and social media platforms managed by the PCU and the PMTs.

7.6.4 Registration of GRM

After receiving comments and complaints, they will be summarized and listed in a Complaints/Comments Log Book, containing the name/group of commenter/complainant, date the comment was received, brief description of the issues, information on proposed corrective actions to be implemented (if appropriate), and the date of response sent to the commenter/complainant.

The acknowledgement of grievances will be within 3 business days and the response will be within 20 business days (depending on the nature of grievance). The project management will keep a grievance log and report on grievance management, as part of annual project progress reports

7.6.5 Response to grievances:

If the identity of the GRM user is known, receipt of the feedback will be acknowledged **within 3 business days.** At the **20 business-day mark,** if a complaint/question is still pending, the GRM focal point for the PMTs and the PCU will provide an update to the non-anonymous GRM user, informing them that there will be delays in resolving their case, and provide the date for which they will be able to provide a response.

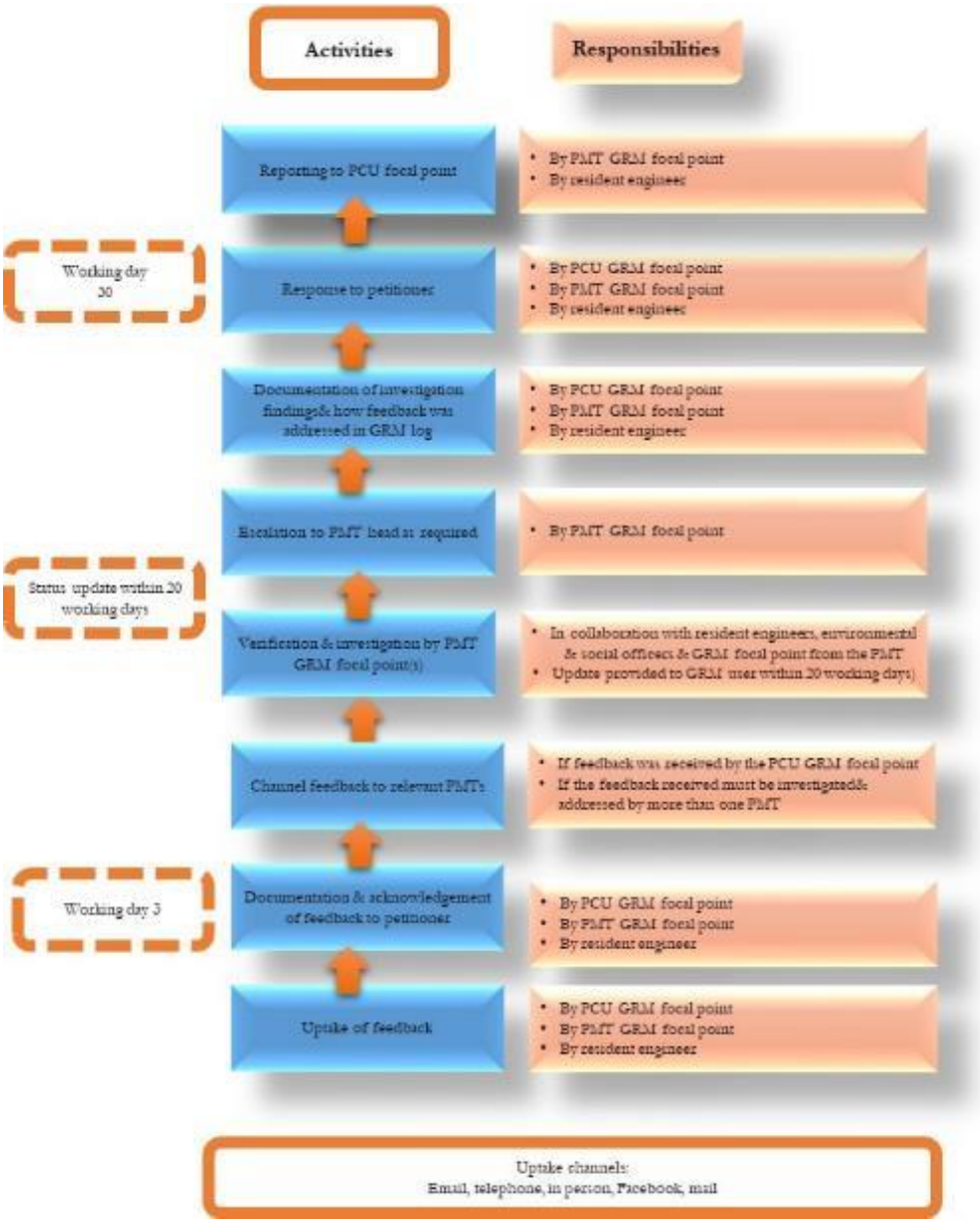


Figure 7-11: Grievance cycle

7.6.6 Confidentiality:

Individuals who submit their comments or grievances have the right to request that their name be kept confidential, though this may mean that the PMT is unable to provide feedback on how the grievance is to be addressed. However, an anonymous complaint shall receive a code and should be investigated appropriately and treated courteously.

7.6.7 Institutional Responsibility for the Grievances

During construction and operation phases, the persons below will be responsible for grievance management:

- Sub project Engineer and Contractors
- PMT GRM Focal Point or Social Development Officer
- PMT Head or Coordinator
- PCU GRM Focal Point
- President of REFAATO

7.6.8 Monitoring of Grievances:

Monitoring:

Monitoring refers to the process of tracking grievances and assessing the extent to which progress is being made to resolve them. All grievance activities should be monitored in order to verify the process. The monitoring process should be implemented as follows:

All information related to contact, cases, tracking and monitoring of feedback cases shall be tracked through a database created for this purpose. The database shall be managed by the PCU GRM focal point and updated and shared by GRM focal points of the PMTs on a monthly basis. All files shall be protected to prevent loss of data and information.

Ultimately, the PCU's GRM focal point will be responsible for consolidating, monitoring, and reporting on the total number of complaints, enquiries and other feedback that have been received, resolved or are pending at the subproject, PMT and PCU levels. As part of this system, the higher levels of the EODP GRM are responsible for monitoring complaints handling performance at the lower levels at any given point during the implementation of this project.

Information compiled by the PCU GRM focal point will be essential for reporting on progress on the EODP's grievance indicators, namely number and percentage of grievances registered that are addressed. The indicators are included in the Project Results Framework on a quarterly basis.

Reporting:

GRM focal points for all PMTs will report to the PCU GRM focal point on the second Monday of each month. The PCU GRM focal point will make consolidated reports available to the REFAATO President on a monthly basis, and to the World Bank on a quarterly basis and upon request.

The reports should provide an overview of feedback received that is related to EODP implementation. Additional information should include:

- Nature of the feedback;
- Aggregate information on the GRM users (incl. demographics – student, parent, gender, etc.);
- Information on where the feedback was received and in what format;
- Information on the status of complaints and queries (resolved, under review, etc.);
- Information on how complaints and queries were resolved; and
- Information on unresolved complaints/queries and why they are not yet resolved.

Such reports may also include recommendations for improving the GRM or the EODP design. These recommendations should be based on the monitoring of the GRM, specifically the extent of the GRM's functionality and the types of feedback that have emerged.

7.6.9 Procedure for Appeal

All citizens have the right to appeal the decision/outcome of a complaint that they have submitted to the EODP GRM. GRM users who are dissatisfied with the outcome of their complaint can resubmit their complaint to the PCU's GRM Coordinator within 30 working days of receiving a response to the previously submitted case.

The PCU's GRM Coordinator has a timeline of:

- 30 working days to investigate and address the issue in collaboration with the GRM focal points of the PMTs, other technical staff from the PMTs, and/or any other persons as relevant; and
- 40 working days to prepare a comprehensive response, including the findings of the investigation and the rationale of the determination.

The final option for the GRM user is to go to court.

ANNEX I UXO Clearance Letter

Ninawa Governorate
Reconstruction
Governor Assistant Office
NO. :
Date : / /2020

محافظة نينوى
مكتب معاون المحافظ
لشؤون الاعمار
العـــدد: ٥٨١
التاريخ : ٦/٨/٢٠٢٠

الى / مديرية الدفاع المدني في محافظة نينوى
م/ تأييد

تحية طيبة ...

لغرض الموافقة على تنفيذ المشاريع المدرجة في ادناه , لتزويدنا بتأييد خلو مواقع هذه المشاريع من الذخائر غير المنفجرة . علما ان المواقع في الجانب الايسر داخل حدود البلدية وتخول السيدين (عمر نظير بشير) و(حمدون يونس خظر) للمتابعة .

.. مع التقدير

المشاريع :

١.تاهيل شبكة الانارة والكهرباء في حي السماح و بازمجة في الجانب الايسر من الموصل
٢.تاهيل الشوارع الداخلية وشبكة تصريف مياه الامطار للقطاع الشرقي من حي السماح في الجانب الايسر لمدينة الموصل
٣.تاهيل الشوارع الداخلية وشبكة تصريف مياه الامطار للقطاع الغربي من حي السماح في الجانب الايسر لمدينة الموصل

المهندس
عبدالوهاب سلطان احمد
معاون المحافظ لشؤون الاعمار
٦/٨/٢٠٢٠

صورة عنه الى :

- مكتب السيد المحافظ / للتفضل بالاطلاع .. مع التقدير
- فريق نينوى لمشاريع الممولة من البنك الدولي / للتفضل بالاطلاع .. مع التقدير
- المكتب/ اضبارة الصادر

E-mail : Construction.nin.iq@gmail.com
EA203086*2020/2/6F

وزارة الداخلية
مديرية الدفاع المدني
مديرية دفاع مدني نينوى
شعبة معالجة القنابل الغير منفلقة
العدد / ١٥٩٩ / ٨٨
التاريخ / ٩ /٢/ ٢٠٢٠

بسم الله الرحمن الرحيم

إلى / محافظة نينوى /مكتب معاون المحافظ لشؤون الاعمار

م/تأييد

****

كتابكم ذي العدد ٢٥١ في ٦/ ٢/٢٠٢٠

بتاريخ ٦/٢/٢٠٢٠ تم ارسال مفرزة معالجة القنابل الغير منفلقة الى المواقع المذكورة في موضوع بحث كتابكم اعلاه حيث تم اجراء المسح الميداني فوق سطح الارض ولم يتم العثور على اي مخلف حربي بالوقت الحالي .

للتفضل بالاطلاع مع التقدير .

العميد الحقوقي
حسام خليل عبد
مدير دفاع مدني نينوى /وكالة
٩ /٢/٢٠٢٠

نسخة منه إلى /
الارشيف الالكتروني
الاضبارة الخاصة

ANNEX II : Contractor's Responsibilities

إجراءات وقائية لإدراجها في المواصفات الفنية للعقود

i. **إجراءات عامة**

أ) يجب ان يتعهد المقاول و موظفيه بتنفيذ اجراءات الوقاية المذكورة وان يتخذ كافة الاحتياطات التي يطلبها المهندس لمنع الضرر نتيجة والحد من اثار اعماله على البيئة بمحاذاة الطريق والتاكد من ان موظفيه وعماله يلتزمون بهذه الاجراءات والاحتياطات.

ب) لا يجب السماح للمقاول باشغال الطريق دون ضرورة, يجب على المقاول استخدام العرض الادنى للطريق الموجود.

ت) اعمال الازالة التي لا يمكن القيام بها بكفاءة خلال انشاء الطريق يجب القيام بها عند اكتمال كل جزء من الطريق (اعمال الحفر والتسوية والصرف) وقبل اصدار شهادة استلام الاعمال :-

- يجب تجميل هذه الاجزاء والقيام باي اعمال اصلاحية دون تاخير وتشمل التشجير .
- يجب تنظيف المجاري المائية والمصارف والترع من العوائق لضمان انسياب المياه .
- يجب استخدام حفر الاستعارة كمزارع سميكة او تصريفها وتامينها حسب الاتفاق مع مالك الارض.

ث) يجب على المقاول ان يقصر اعمال البناء بين الساعة (6) صباحا حتى (7) مساءا اذا كانت تتم في منطقة سمنية او قريبة منها.

ج) يجب على المقاول تجنب استخدام معدات ثقيلة او مزعجة في مناطق معينة اثناء الليل او في مناطق حساسة مثل القريبة من المستشفيات .

ح) يجب على المقاول ان يقوم باعمال رش المياه بصفة منتظمة للتراب والحصى من اجل منع التلوث بالغبار خلال فترات الجفاف وان يقوم بتغطية سيارات نقل مواد البناء لمنع سقوطها.

ii. **النقـــــــــل**

أ) يجب على المقاول استخدام طرق مختارة بالاتفاق مع المهندس وسيارات ذات حجم مناسب لنوع الطريق وتحديد الحمولة لمنع تلف الطرق والجسور المستخدمة في عملية النقل لموقع المشروع , المقاول يتحمل المسؤلية عن اي تلف للطرق والجسور بسبب نقل حمولات زائدة ويجب ان يطلب منه اصلاح هذه التلفيات بالاتفاق مع المهندس.

ب) لايجب ان يستخدم المقاول اي سيارات , سواء على الطريق او خارجه , ينتج عنها تلوث زائد من ماسورة العادم او ضوضاء وائدة , ويجب تركيب عوازل للضوضاء وصيانتها في جميع السيارات الخاضعة للمقاول التي تستخدم في المناطق السكنية .

ت) يجب ان يستخدم المقاول ضوابط مناسبة لسلامة حركة المرور طوال مدة تنفيذ العقد وتخضع هذه الضوابط للموافقة المسبقة من المهندس.

iii. **العمـــــــالة**

أ) يجب على المقاول ان يستخدم اكبر قدر ممكن من العمالة المحلية وان يوفر لهم التدريب اللازم عند الضرورة .

ب) يجب على المقاول تركيب وصيانة نظام خزانات مؤقت لتجميع الصرف الصحي لمخلفات معسكرات العمال السكنية وضمان عدم تلويث هذا النظام للمجاري المائية القريبة.

ت) يجب على المقاول انشاء وسائل ونظام لتخزين والتخلص من كافة المخلفات الصلبة الناتجة عن معسكر العمال و / او معسكر الادارة .

ث) يجب على المقاول ان لايسمح باستخدام خشب الاشجار كوقود للطهي او التدفئة في اي معسكر للعمال او الادارة ولكن يجب استخدام بدائل اخرى.

ج) يجب على المقاول ضمان ان مكاتب ومستودعات الموقع وخصوصا مواقع تخزين وقود الديزل والبيتومين والاسفلت , تقع على مسافة (500) متر على الاقل من المجاري المائية وتدار بحيث لا ينتج عنها ملوثات تصل للمجاري المائية سواء السطحية والجوفية , وخاصة خلال فترات المطر. وهذا يتطلب اعادة تدوير الشحومات وحفر خندق حول المنطقة به مصايد للزيوت عند المخارج.

ح) لن يستخدم المقاول خشب وقود في التدفئة خلال تصنيع او اعداد اي مواد تشكل جزء من العمل.

iv. المحاجر وحفر الاستعارة

أ) يجب ان يخضع تشغيل منطقة استعارة جديدة سواء على الارض في النهر او في منطقة موجودة لموافقة مسبقة من المهندس ويجب ان يتوقف العمل اذا اصدر المهندس تعليمات بذلك ويجب حضر حفر الاستعارة اذا تعارضت مع مسارات الصرف الطبيعي او المخططة. يجب حضر هذه المواقع على النهر حيث يمكن ان تؤدي لهبوط او تدمير ضفاف النهر او تسبب سقوط كميات كبيرة من المواد الناعمة في مجرى المياه.

ب) يجب ان يضمن المقاول ان حفر الاستعارة المستخدمة قد تركت في حالة ثبات وجوانبها المائلة مستقرة وجافة لضمان عدم تراكم مياه آسنة تؤدي لتكاثر الناموس.

ت) يجب اخذ الصخور او الحصى من النهر من مسافات متباعدة بحيث يقتصر عرض المواد المأخوذة على واحد على عشرة من عرض النهر في اي موقع واحد وبحيث لا يعوض انسياب النهر او يتلف او يضر بضفتي النهر.

ث) يجب ان يخضع موقع الكسارات لموافقة المهندس والا يكون قريبا من المناطق الحساسة بيئيا او المناطق السكنية القائمة وتشغيلها بوسائل معتمدة للتحكم في الغبار.

v. الاعمال الترابية

أ) يجب التحكم بطريقة مناسبة في الاعمال الترابية وخصوصا خلال موسم سقوط الامطار .

ب) يجب على المقاول ان يحافظ على الجوانب المائلة في مناطق الحفر والردم مستقرة في جميع الاوقات والحد قدر المستطاع من تاثر المناطق المجاورة لمنطقة العمل .

ت) يجب على المفاول الانتهاء من اعمال الحفر والردم للمقاطع العرضية النهائية في اي موقع باسرع وقت ممكن ومن الافضل في عملية واحدة مستمرة وان لايترك جزء غير مكتمل من هذه الاعمال وخصوصا في موسم سقوط الامطار

ث) يجب توفير المصارف علوية وسفلية اعلى واسفل المنحدرات من اجل حماية اي ميول للحفر والردم من التآكل ,طبقا للتصميمات وزراعتها بالحشائش او غيرها من الغطاء الاخضر. يجب توفير مصارف علوية فوق تلال الحفر العالية لتقليل جريان المياه وتآكل الميل .

ج) يجب التخلص من اي ناتج حفر او مواد غير مناسبة في مقالب مخصصة لذلك بالاتفاق مع المهندس.

ح) يجب عدم اختيار موقع هذه المقالب بحيث تشكل منزلقات في المستقبل او تتعاض مع الاراضي الزراعية او الانشطة الاخرى او تجرف تربة المقلب في مجرى المياه. قد تنشأ حاجة لعمل مصارف داخل وحول المقالب وحسب توجيهات المهندس.

vi. **المواقع التاريخية والأثرية**

اذا اكتشف المقاول خلال اعمال الحفر او البناء مواقع او مقتنيات اثرية او ثقافية او تاريخية , يجب على المقاول:

أ) وقف اعمال البناء في المنطقة المكتشفة.

ب) عمل كردون (تصوير) حول الموقع اوالمنطقة المكتشفة .

ت) تامين الموقع لمنع تلف او فقدان المقتنيات التي يمكن نقلها. في حالة وجود مقتنيات اثرية او حساسة يمكن نقلها, يجب تواجد حارس ليلي حتى يتم تسليم الموقع للسلطة المحلية ووزارة الثقافة.

ث) اخطار المهندس المشرف الذي يقوم بدوره باخطار السلطة المحلية المسئولة ووزارة الثقافة فورا (اقل من 24 ساعة).

ج) الاتصال بالجهة المحلية المسئولة ووزارة الثقافة لمباشرة مسئولية حماية والحفاظ على الموقع قبل اتخاذ قرار بالاجراءات المناسبة التي سيتم تنفيذها . قد يتطلب ذلك عمل تقييم مبدئي للموجودات بواسطة خبراء الاثار في وزارة الثقافة (خلال 72 ساعة) . يجب تقييم اهمية الموجودات طبقا للمعايير المختلفة الخاصة بالتراث الثقافي وتشمل القيمة الجمالية والتاريخية والعلمية والبحثية والاجتماعية والاقتصادية.

ح) ضمان ان تتخذ السلطة المحلية المسئولة ووزارة الثقافة قرار كيفية التعامل مع الموجودات . وقد يشمل ذلك تغيير التصميم (على سبيل المثال عندما تكون الموجودات آثار لا يمكن نقلها) , وطرق المحافظة والاستعادة والترميم.

خ) تنفيذ قرار السلطة المحلية الخاص بادارة الموجودات يجب توزيعه مكتوبا بواسطة وزارة الثقافة.

د) تستانف الاعمال فقط بعد استلام تصريح كتابي بذلك من الجهة المحلية المسئولة ووزارة الثقافة بخصوص اجراءات تامين الآثار المكتشفة.

vii. **التخلص من مخلفات البناء ومخلفات السيارات**

أ) يجب اعادة استخدام المخلفات الناتجة من تفكيك المنشآت الحالية قدر الامكان في الانشاءات المقترحة (مثل استعمالها كمواد ردم) يجب التخلص من مخلفات البناء المتبقية في مواقع يحددها ويوافق عليها مهندس المشروع فقط. يجب على المقاول ان يضمن ان هذه المواقع (أ) لا توجد في مناطق غابات , (ب) لا تؤثر على مسارات الصرف الطبيعي , (ج) لا تؤثر على الحياة البرية النادرة والمهددة بالانقراض . يجب تحت اي ظرف من الظروف ان يقوم المقاول بالتخلص من اي مخلفات او مواد في المناطق البيئية الحساسة.

ب) في حالة التخلص من اي قمامة او مخلفات بناء او طمي في ارض مجاورة , يجب على المقاول ان يقوم فورا بازالتها وتنظيف المنطقة المتضررة واعادتها لحالتها الاصلية طبقا لرضا المشرف / المهندس.

ت) يجب التخلص من المواد الطينية او المختلفات المشابهة المتولدة من الحفر او انشطة البناء الاخرى بحيث لا تنساب في المياه السطحية او تشكل كتل طينية في المنطقة.

ث) كافة ترتيبات النقل خلال اعمال البناء وتشمل التوريد والصيانة والتفكيك وازالة المخلفات عند الضرورة , سوف تعتبر مكملة للعمل ويجب ان يتم تخطيطها وتنفيذها بواسطة المقاول حسب موافقة وتعليمات المهندس.

ج) يجب القيام بتشغيل وصيانة واعادة التزود بالوقود للسيارات / الالات ومعدات التشغسل بطريقة لا تؤدي الى انسكاب الوقود والشحومات وتلويث الارض . سوف يتم توفير مصدات للزيوت في مناطق الغسيل واعادة التزود بالوقود . يجب ان تكون مستودعات الوقود في مكان مناسب ومعزول.

ح) يجب التخلص من كافة الانسكابات والمنتجات البترولية المجمعة طبقا للاجراءات / الارشادات البيئية القياسية . يجب ان تقع مناطق تخزين الوقود ومناطق التزود بالوقود على مسافة (300) متر على الاقل من منشآت الصرف ومصادر المياه المهمة او حسب تعليمات المهندس.

Annex III: Cultural Heritage Chance Find Procedure

Cultural property includes monuments, structures, works of art, or sites of significance points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards, and graves. During the project induction meeting, all contractors will be made aware of the presence of an on-site archaeologist who will monitor earthmoving and excavation activities.

The initial phase of the proposed emergency reconstruction operations pose limited risks in damaging cultural property since sub-projects will largely consist of small investments in community infrastructure and income generating activities, reconstruction of existing structures, and minor public works. Further, it is understood by the Consultant that any activity that would adversely impact cultural property would make a subproject ineligible. Nevertheless, the Consultant will check that the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed in the event that archaeological material is discovered:

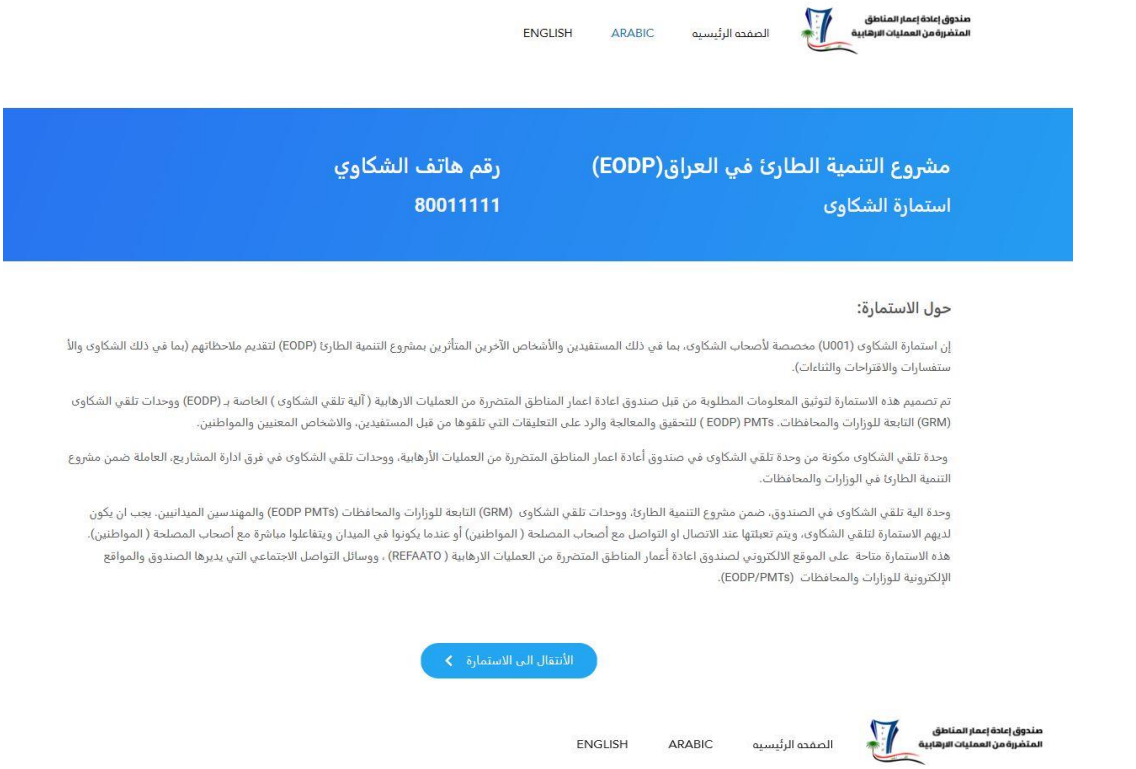
- Stop all construction activities in the area of the chance find.
- Delineate the discovered site or area.
- Record the find location, and all remains are to be left in place.
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Ministry of Culture immediately (within 24 hours or less);
- Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Ministry of Culture (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values.
- Decisions on how to handle the findings shall be taken by the responsible authorities and the Ministry of Culture. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage.
- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Ministry of Culture; and
- Construction work could resume only after permission is given from the responsible local authorities and the Ministry of Culture concerning safeguard of the heritage.
- The Consultant will ensure that during project supervision, the Site engineer will monitor the above regulations relating to the treatment of any chance find encountered and observed. Relevant findings will be recorded in World Bank Project Supervision Reports (PSRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

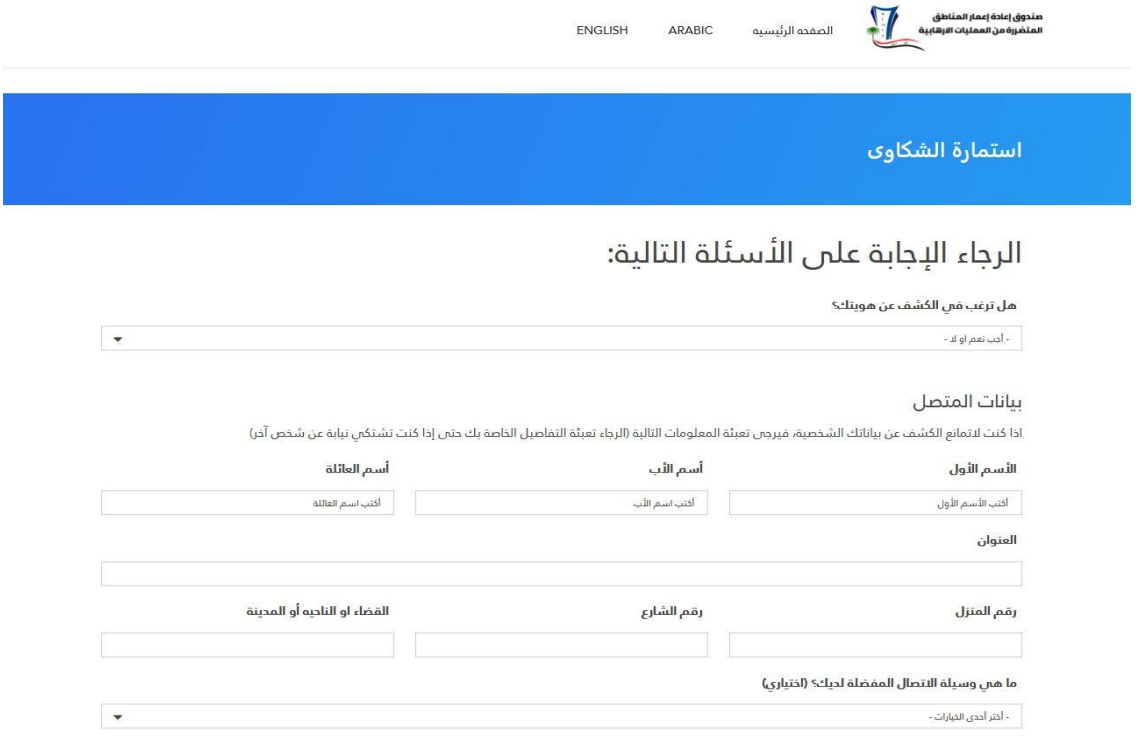
Annex III : Main Stakeholders Identified for the Project

Categories	Stakeholder Groups	Role/Concern
Potential Affected Communities in Al Samah and Yarimcha Districts	Residents of the site	• They are the main stakeholders. • They will be responsible of communicating with the Project and other community people.
	Vulnerable groups, i.e. women, young people, and elders	• They are the potential Project Affected Persons (PAPs), i.e. households and communities that will receive impacts (positive/negative) as a result of the project. • Given their vulnerable status they might be severely affected by positive or negative impacts.
Governmental sector	El Mosul Municipality	• The main role of the municipality authority is the provision of support to the project through mobilizing people to gain information about the project. • Permits for the state owned lands needed for storage purposes should be prepared by the municipality. • Paving roads.
Environmental sector	The Ministry of Health and Environment (MoHE)	• Responsible for developing public policies related to the protection of environment and improving its quality. Also, it is responsible for issuing regulations for environmental determinants and for monitoring their implementation.
Funding Agencies	The World Bank (WB)	• Financiers and regulators because their safeguards will influence the implementation of the project. • Responsible for reviewing and approving safeguard documents
	REFAATO - EODP	• Project client, responsible for allocation of funding and prioritization of projects
Project Owner	The Ministry of Electricity	• Implementing agency overseeing activities of the Environmental and Social Management Plan
Other Governmental Entities	Ninawa Governorate	• Provision of data required about project sites • Taking necessary security measures. • Educating population on and implementing the GRM.

	Environmental Office within the Governorates	• Responsible for monitoring compliance to environmental requirements.
	Health Directorate	• Health directorates provide health services to local units and project labourers through the health services' providers
	Electricity department Mosul	• They are responsible for any projects related to electricity in El Mosel. • The current project included the OHTL will fall under their responsibility
	Directorate for Antiquities	• It has a role in providing the maps that illustrate the archaeological sites near the Project areas, as well as the procedures to be followed in case of finding any antiquities.
Ministries	Ministry of Interior Affairs and Traffic	• They have a role in mitigating impacts related to traffic • They expressed their willingness to provide security to the project (if needed).
	Ministry of Labour	• They oversee working conditions and worker's occupational health and safety.
Contractors	Contractors	• They will be responsible for the implementation of the sub-projects as well as the ESMP
Traders and Suppliers	Traders (small scale stores)	• They provide workers with food and amenities.
	Small contractors	• They may be affected because they are situated in the project's adjacent areas.
Civil Society	NGOs (regional, local)	• They support the local community by providing capacity building activities. • They play an active role in any awareness-raising activities related to the project. • They are responsible of sharing information with the community.
Media	Television Representatives Newspaper Websites Editors Social Media	• They disclose information about the project.

Annex IV Feedback Uptake Form on ReFAATO's Website (Arabic and English)





صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية
الصفحه الرئيسيه ARABIC ENGLISH

تفاصيل الحالة

تفاصيل عن حالة الشكوى

نوع المشروع

المحافظة

المنطقه

اسم المشروع (اذا كان معروفا)

وصف مفصل للحالة

صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية
الصفحه الرئيسيه ARABIC ENGLISH

تفاصيل الاتصال

إذا تم تقديم الملاحظات نيابة عن شخص آخر

ما هي علاقتك بالشخص الذي يتم تقديم الملاحظات نيابة عنه؟

- اختر أحد الخيارات -

تفاصيل الشخص الذي يتم تقديم الملاحظات نيابة عنه

الاسم الأول | اسم الأب | اسم العائلة

العنوان

رقم المنزل | رقم الشارع | القضاء او القريه أو المدينة

ما هي وسيلة الاتصال المفضلة لديك؟ (اختياري)

- اختر أحد الخيارات -

هل يواجه هذا الشخص أيّاً من التحديات التالية التي يجب مراعاتها أثناء الاتصال به أو الرد عليه؟

- اختر أحد الخيارات -

EcoConServ ENVIRONMENTAL SOLUTIONS

الأدلة التي يمكنك مشاركتها مع الصندوق لتوثيق الحالة

أرفع الملف الخاص بك

إذا كانت شكوى، هل اتخذت أي إجراء لمعالجة مشكلة الشكوى؟ إذا كانت الإجابة نعم، يرجى توضيح ما هي الخطوات التي اتخذتها حتى الآن؟

هل لديك أية اعتراضات على ما يلي

- [ ] تلقي اتصال من فريق إدارة المشروع لمزيد من التوضيح والمناقشة حول القضية؟
- [ ] إجراء مقابلة مع المختص في وحدة تلقي الشكاوى في صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية بعد حصولك على الرد للحالة المقدمة من قبلك (شكوى – مقترح – استفسار) لقياس مدى رضاك عن النتائج؟

يرجى ملاحظة/ أنه يحق لجميع المواطنين الطعن في قرار نتيجة الشكوى التي قدمت الى EOPD GRM . يحق لمستخدمي آلية تلقي الشكاوى الغير راضين عن نتيجة شكواهم اعادة تقديم شكواهم الى المختص في وحدة تلقي الشكاوى (REFATTO GRM Coordinator) في غضون 30 يوم من تلقي الرد على الحالة السابقة. الخيار الاخر هو التوجه للقضاء عبر المحاكم المختصة.

أرسل البيانات

صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية

الصفحة الرئيسية ARABIC ENGLISH

FEEDBACK UPTAKE FORM FOR GRIEVANCE REDRESS MECHANISM

Please answer the following questions

Do you wish to remain anonymous

- Yes or No -

Contact Details

If you do not wish to remain anonymous, then please fill out the following information [Please fill in your details even if you are complaining on behalf of someone else]

First Name	Father's name	Family Name

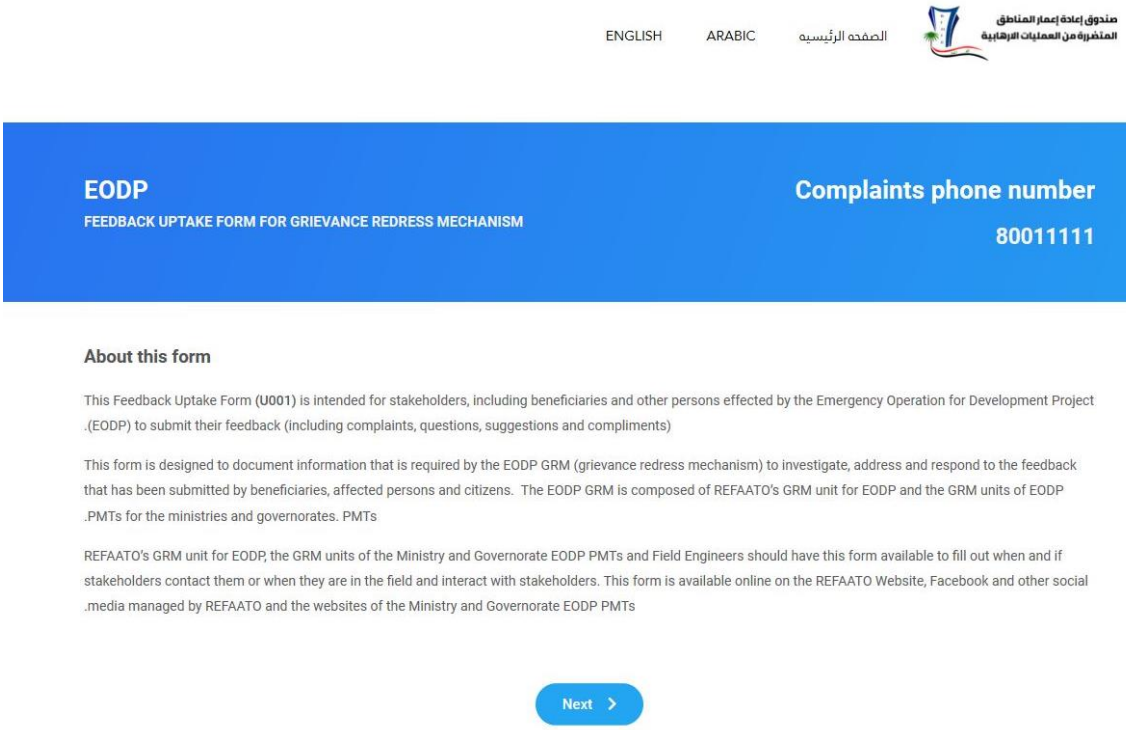
Address

Town or city	Street name	House number or name

What is your preferred mean of communication

- optional -

Eco Con Serv
ENVIRONMENTAL SOLUTIONS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الصفحه الرئيسيه
صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية
EODP
FEEDBACK UPTAKE FORM FOR GRIEVANCE REDRESS MECHANISM
Complaints phone number
80011111
About this form
This Feedback Uptake Form (U001) is intended for stakeholders, including beneficiaries and other persons effected by the Emergency Operation for Development Project .(EODP) to submit their feedback (including complaints, questions, suggestions and compliments)
This form is designed to document information that is required by the EODP GRM (grievance redress mechanism) to investigate, address and respond to the feedback that has been submitted by beneficiaries, affected persons and citizens. The EODP GRM is composed of REFAATO's GRM unit for EODP and the GRM units of EODP .PMTs for the ministries and governorates. PMTs
REFAATO's GRM unit for EODP, the GRM units of the Ministry and Governorate EODP PMTs and Field Engineers should have this form available to fill out when and if stakeholders contact them or when they are in the field and interact with stakeholders. This form is available online on the REFAATO Website, Facebook and other social .media managed by REFAATO and the websites of the Ministry and Governorate EODP PMTs
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Details of the person on whose behalf feedback is being submitted

First Name | Father's name | Family Name

Address

Town or city | Street name | House number or name

WhatsApp / Viber / Facebook / Messenger | Email | Phone

Do you have any physical disabilities

- Yes Or No -

Details of Feedback

Type of Project

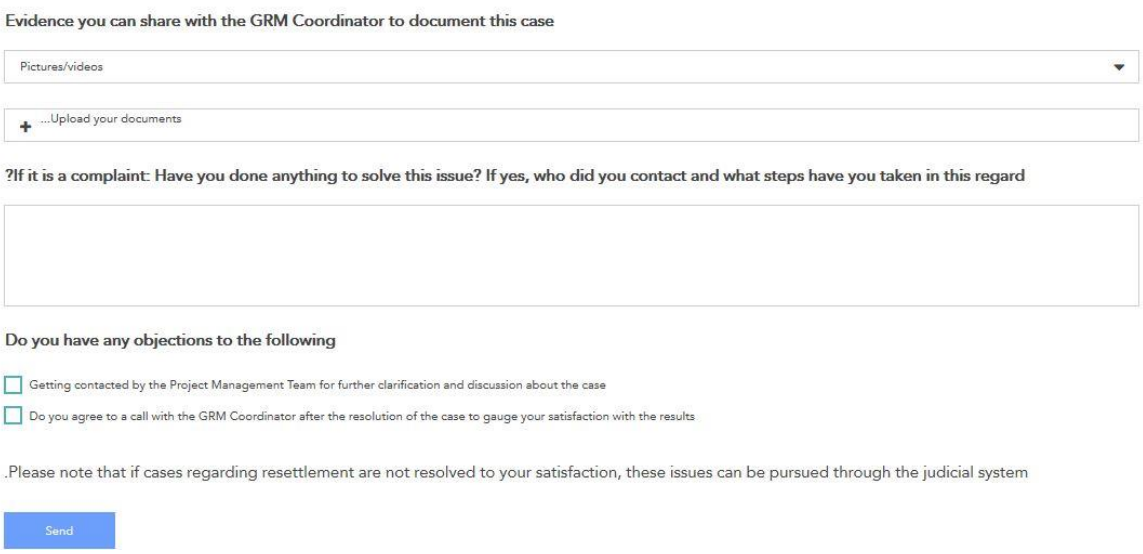
Governorate

City

Project Name (if it is known)

Detailed description of feedback

Please provide a description of your feedback. For complaints and queries, please describe in detail the grievance/complaint/recommendations you have


Evidence you can share with the GRM Coordinator to document this case
Pictures/videos
...Upload your documents
?If it is a complaint: Have you done anything to solve this issue? If yes, who did you contact and what steps have you taken in this regard
Do you have any objections to the following
Getting contacted by the Project Management Team for further clarification and discussion about the case
Do you agree to a call with the GRM Coordinator after the resolution of the case to gauge your satisfaction with the results
.Please note that if cases regarding resettlement are not resolved to your satisfaction, these issues can be pursued through the judicial system
Send