

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

| | | | | | | | | |
|-----|--|---|--|--|--|--|--|-----|
| 1 | Date: February 8, 2019 Impact Site Name: Rosemont Copper Project Impact Cowardin or HGM type: ephemeral | Corps File No.: SPL-2008-00816-MB ORM Resource Type: Riverine Impact area: 45.9 acres | Project Manager: SPD Team Hydrology: ephemeral Impact distance: linear feet | | | | | |
| | Column A | Column B | Column C | Column D | Column E | | | |
| | Mitigation Site Name: Sonoita Creek formerly re-estab lishment Mitigation Type: rehabilitation ORM Resource Type: Riverine-Ephemeral Cowardin/HGM type: ephemeral Hydrology: ephemeral | Mitigation Site Name: Sonoita Creek Mitigation Type: rehab litation ORM Resource Type: Riverine-Ephemeral Cowardin/HGM type: ephemeral Hydrology: ephemeral | Mitigation Site Name: Sonoita Creek Ranch Ponds Mitigation Type: enhancement ORM Resource Type: Lacustrine Cowardin/HGM type: perennial Hydrology: perennial | Mitigation Site Name: Sonoita Creek Channel buffer Mitigation Type: reestablishment ORM Resource Type: Upland Cowardin/HGM type: upland Hydrology: upland | Mitigation Site Name: Sonoita Creek Channel buffer Mitigation Type: rehabilitation ORM Resource Type: Cowardin/HGM type: Upland Hydrology: upland | | | |
| 2.a | Qualitative impact-mitigation comparison: Starting ratio: 1.0 : 1.0 Ratio adjustment: -0.3 Baseline ratio: 1.00 : 1.25 PM justification: see Table | Qualitative impact-mitigation comparison: Starting ratio: 1.0 : 1.0 Ratio adjustment: -0.3 Baseline ratio: 1.00 : 1.25 PM justification: see Table 1 | Qualitative impact-mitigation comparison: Starting ratio: 1.0 : 1.0 Ratio adjustment: -0.3 Baseline ratio: 1.00 : 1.30 PM justification: see Table 1 | Qualitative impact-mitigation comparison: Starting ratio: 1.0 : 1.0 Ratio adjustment: 2.0 Baseline ratio: 3.00 : 1.00 PM justification: see Table 1 | Qualitative impact-mitigation comparison: Starting ratio: 1.0 : 1.0 Ratio adjustment: 2.5 Baseline ratio: 3.50 : 1.00 PM justification: see Table 1 | | | |
| 2.b | Quantitative impact-mitigation comparison: | | | | | | | |
| 2.c | Preservation (Table 2 etan A) | | | | | | | N/A |
| 3 | Preservation (Table 2 etan E) | | | | | | | N/A |
| 4 | Mitigation site location: Ratio adjustment: 1 PM justification: Mitigation site is outside of project watershed. | Mitigation site location: Ratio adjustment: 1 PM justification: Mitigation site is outside of project watershed. | Mitigation site location: Ratio adjustment: 1 PM justification: Mitigation site is outside of project watershed. | Mitigation site location: Ratio adjustment: 1 PM justification: Mitigation site is outside of project watershed. | Mitigation site location: Ratio adjustment: 1 PM justification: Mitigation site is outside of project watershed. | | | |
| 5 | Net loss of aquatic resource surface area: Ratio adjustment: 1 PM justification: Net loss due to mitigation type rehabilitation. | Net loss of aquatic resource surface area: Ratio adjustment: 1 PM justification: Net loss due to mitigation type rehabilitation. | Net loss of aquatic resource surface area: Ratio adjustment: 1 PM justification: Net loss due to mitigation type enhancement. | Net loss of aquatic resource surface area: Ratio adjustment: 0 PM justification: Net increase due to mitigation type re-establishment. | Net loss of aquatic resource surface area: Ratio adjustment: 1 PM justification: Net loss due to mitigation type rehabilitation. | | | |
| 6 | Type conversion: Ratio adjustment: -0.25 Conversion from degraded, incised, to fully functioning with floodplain access. | Type conversion: Ratio adjustment: 0 PM justification: No type conversion. | Type conversion: Ratio adjustment: -0.25 PM justification: Conversion from degraded wetlands with non-native vegetation to native wetland vegetation. | Type conversion: Ratio adjustment: 0 PM justification: No type conversion. | Type conversion: Ratio adjustment: 0 PM justification: No type conversion. | | | |
| 7 | Risk and uncertainty: Ratio adjustment: 0.8 Permittee-responsible, modified hydrology, at 0.3 each, and long-term maintenance 0.2 | Risk and uncertainty: Ratio adjustment: 0.3 PM justification: Permittee responsible. | Risk and uncertainty: Ratio adjustment: 0 Limited risk, ponds need minor work to increase/improve fringe wetlands. | Risk and uncertainty: Ratio adjustment: 0.3 PM justification: Permittee responsible. | Risk and uncertainty: Ratio adjustment: 0.3 PM justification: Permittee responsible. | | | |
| 8 | Temporal loss: Ratio adjustment: 2 PM justification: Time to reach maturity - shrub layer (mesquite). | Temporal loss: Ratio adjustment: 2 PM justification: Time to reach maturity - shrub layer (mesquite). | Temporal loss: Ratio adjustment: 1 PM justification: Time to reach maturity - herbaceous layer. | Temporal loss: Ratio adjustment: 1 PM justification: Time to reach maturity - herbaceous layer. | Temporal loss: Ratio adjustment: 1 PM justification: Time to reach maturity - herbaceous layer. | | | |
| 9 | Final mitigation ratio(s): Baseline ratio from 2.a, b or c: 1.00 : 1.25 Total adjustments (3-8): 4.55 Final ratio: 4.44 : 1.00 Proposed impact (total): 45.9 acres to Resource type: 0 ephemeral ephemeral ephemeral Cowardin or HGM: ephemeral Hydrology: ephemeral Required Mitigation*: 203.80 acres linear feet of Resource type: 0 Cowardin or HGM: Riverine-Ephemeral Hydrology: ephemeral Proposed Mitigation**: 55.66 acres linear feet Impact Unmitigated: 73 33.36 % acres Additional PM comments: none | Final mitigation ratio(s): Baseline ratio from 2.a, b or c: 1.00 : 1.25 Total adjustments (3-8): 4.30 Final ratio: 4.24 : 1.00 Remaining impact: 33.36 acres to Resource type: 0 ephemeral ephemeral ephemeral Cowardin or HGM: ephemeral Hydrology: ephemeral Required Mitigation*: 141.46 acres linear feet of Resource type: 0 Cowardin or HGM: Riverine-Ephemeral Hydrology: ephemeral Proposed Mitigation**: 5.88 acres linear feet Impact Unmitigated: 96 31.98 % acres Additional PM comments: none | Final mitigation ratio(s): Baseline ratio from 2.a, b or c: 1.00 : 1.30 Total adjustments (3-8): 2.75 Final ratio: 2.88 : 1.00 Remaining impact (acres): 31.98 acres Remaining impact (linear feet): 0 to Resource type: 0 ephemeral ephemeral ephemeral Cowardin or HGM: ephemeral Hydrology: ephemeral Required Mitigation: 92.24 0.0 acres linear feet of Resource type: 0 Cowardin or HGM: Lacustrine perennial Hydrology: perennial Proposed Mitigation**: 6.00 acres linear feet Impact Unmitigated: 93 29.90 % acres Additional PM comments: none | Final mitigation ratio(s): Baseline ratio from 2.a, b or c: 3.00 : 1.00 Total adjustments (3-8): 2.30 Final ratio: 5.30 : 1.00 Remaining impact (acres): 29.90 acres Remaining impact (linear feet): 0 to Resource type: 0 ephemeral ephemeral ephemeral Cowardin or HGM: ephemeral Hydrology: ephemeral Required Mitigation: 158.46 0.0 acres linear feet of Resource type: 0 Cowardin or HGM: Upland upland Hydrology: upland Proposed Mitigation**: 34.58 acres linear feet Impact Unmitigated: 78 23.37 % acres Additional PM comments: none | Final mitigation ratio(s): Baseline ratio from 2.a, b or c: 3.50 : 1.00 Total adjustments (3-8): 3.30 Final ratio: 6.80 : 1.00 Remaining impact (acres): 23.37 acres Remaining impact (linear feet): 0 to Resource type: 0 ephemeral ephemeral ephemeral Cowardin or HGM: ephemeral Hydrology: ephemeral Required Mitigation: 158.93 0.0 acres linear feet of Resource type: 0 Cowardin or HGM: Upland upland Hydrology: upland Proposed Mitigation**: 12.10 acres linear feet Impact Unmitigated: 92 21.59 % acres Additional PM comments: none | | | |
| 10 | Final compensatory mitigation requirements: | Final requirement is for mitigation proposed as shown and in Hudbay Rosemont Final HMMP and associated comment response letters. | | | | | | |

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

| Column F | | | Column G | | | Column H | | | Column I | | |
|----------------------------------|--|-------------------|----------------------------------|---|-------------------|----------------------------------|---|-------------------|----------------------------------|--|-------------------|
| Mitigation Site Name: | Sonoita Creek ephemeral tributaries buffer | | Mitigation Site Name: | Sonoita Creek ephemeral tributaries | | Mitigation Site Name: | Sonoita Creek Floodplain uplands Restoration | | Mitigation Site Name: | Sonoita Creek, Corral Canyon and ephemeral tributaries | |
| Mitigation Type: | enhancement/preservation | | Mitigation Type: | re-establishment/preservation | | Mitigation Type: | enhancement | | Mitigation Type: | enhancement/preservation | |
| ORM Resource Type: | | | ORM Resource Type: | | | ORM Resource Type: | | | ORM Resource Type: | | |
| Cowardin/HGM type: | Upland | | Cowardin/HGM type: | Riverine-Ephemeral | | Cowardin/HGM type: | upland | | Cowardin/HGM type: | Riverine-Ephemeral | |
| Hydrology: | upland | | Hydrology: | ephemeral | | Hydrology: | upland | | Hydrology: | ephemeral | |
| Starting ratio: | 1.0 : | 1.0 | Starting ratio: | 1.0 : | 1.0 | Starting ratio: | 1.0 : | 1.0 | Starting ratio: | 1.0 : | 1.0 |
| Ratio adjustment: | 3.0 | | Ratio adjustment: | -0.3 | | Ratio adjustment: | 4.0 | | Ratio adjustment: | 2.5 | |
| Baseline ratio: | 4.00 : | 1.00 | Baseline ratio: | 1.00 : | 1.30 | Baseline ratio: | 5.00 : | 1.00 | Baseline ratio: | 3.50 : | 1.00 |
| PM justification: | see Table 1 | | PM justification: | see Table 1 | | PM justification: | see Table 1 | | PM justification: | see Table 1 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Ratio adjustment: | 1 | | Ratio adjustment: | 1 | | Ratio adjustment: | 1 | | Ratio adjustment: | 1 | |
| PM justification: | Mitigation site is outside of project watershed. | | PM justification: | Mitigation site is outside of project watershed. | | PM justification: | Mitigation site is outside of project watershed. | | PM justification: | Mitigation site is outside of project watershed. | |
| Ratio adjustment: | 1 | | Ratio adjustment: | 0 | | Ratio adjustment: | 1 | | Ratio adjustment: | 0 | |
| PM justification: | Net loss due to mitigation type enhancement with preservation. | | PM justification: | Net increase due to mitigation type re-establishment with preservation. | | PM justification: | Net loss due to mitigation type enhancement. | | PM justification: | Net loss due to mitigation type enhancement with preservation. | |
| Ratio adjustment: | 0 | | Ratio adjustment: | -0.25 | | Ratio adjustment: | 0 | | Ratio adjustment: | 0 | |
| PM justification: | No type conversion. | | PM justification: | Conversion from upland to waters. | | PM justification: | No type conversion. | | PM justification: | No conversion. | |
| Ratio adjustment: | 0.3 | | Ratio adjustment: | 0.3 | | Ratio adjustment: | 0.3 | | Ratio adjustment: | 0.3 | |
| PM justification: | Permittee responsible. | | PM justification: | Permittee responsible. | | PM justification: | Permittee responsible. | | PM justification: | Permittee responsible. | |
| Ratio adjustment: | 0 | | Ratio adjustment: | 0 | | Ratio adjustment: | 2 | | Ratio adjustment: | 0 | |
| PM justification: | No change, enhancement and preservation. | | PM justification: | No change, ephemeral tributaries re-establishment and preservation. | | PM justification: | Time to reach maturity - shrub/scrub layer. | | PM justification: | No change, ephemeral tributaries enhancement and preservation. | |
| Baseline ratio from 2.a, b or c: | 4.00 : | 1.00 | Baseline ratio from 2.a, b or c: | 1.00 : | 1.30 | Baseline ratio from 2.a, b or c: | 5.00 : | 1.00 | Baseline ratio from 2.a, b or c: | 3.50 : | 1.00 |
| Total adjustments (3-8): | 2.30 | | Total adjustments (3-8): | 1.05 | | Total adjustments (3-8): | 4.30 | | Total adjustments (3-8): | 1.30 | |
| Final ratio: | 6.30 : | 1.00 | Final ratio: | 1.58 : | 1.00 | Final ratio: | 9.30 : | 1.00 | Final ratio: | 4.80 : | 1.00 |
| Remaining impact (acres): | 21.59 | acres | Remaining impact (acres): | 11.07 | acres | Remaining impact (acres): | 8.27 | acres | Remaining impact (acres): | -4.31 | acres |
| Remaining impact (linear feet): | 0 | linear feet | Remaining impact (linear feet): | 0 | linear feet | Remaining impact (linear feet): | 0 | linear feet | Remaining impact (linear feet): | 0 | linear feet |
| to Resource type: | ephemeral | | to Resource type: | ephemeral | | to Resource type: | ephemeral | | to Resource type: | ephemeral | |
| Cowardin or HGM: | ephemeral | | Cowardin or HGM: | ephemeral | | Cowardin or HGM: | ephemeral | | Cowardin or HGM: | ephemeral | |
| Hydrology: | ephemeral | | Hydrology: | ephemeral | | Hydrology: | ephemeral | | Hydrology: | ephemeral | |
| Required Mitigation: | 136.04 | acres | Required Mitigation: | 17.46 | acres | Required Mitigation: | 76.94 | acres | Required Mitigation: | -20.68 | acres |
| of Resource type: | 0.0 | linear feet | of Resource type: | 0.0 | linear feet | of Resource type: | 0.0 | linear feet | of Resource type: | 0.0 | linear feet |
| Cowardin or HGM: | Upland | | Cowardin or HGM: | Riverine-Ephemeral | | Cowardin or HGM: | upland | | Cowardin or HGM: | Riverine-Ephemeral | |
| Hydrology: | upland | | Hydrology: | ephemeral | | Hydrology: | upland | | Hydrology: | ephemeral | |
| Proposed Mitigation**: | 66.30 | acres linear feet | Proposed Mitigation**: | 4.41 | acres linear feet | Proposed Mitigation**: | 117.00 | acres linear feet | Proposed Mitigation**: | 19.28 | acres linear feet |
| Impact Unmitigated: | 51 | % | Impact Unmitigated: | 75 | % | Impact Unmitigated: | -52 | % | Impact Unmitigated: | -193 | % |
| | 11.07 | acres | | 8.27 | acres | | -4.31 | acres | | -8.32 | acres |
| Additional PM comments: | none | | Additional PM comments: | none | | Additional PM comments: | With the proposed Sonoita Creek Floodplain uplands restoration, the proposed action has been fully compensated. However, the applicant has also proposed Sonoita Creek, Corral Canyon, and ephemeral tributary enhancement/preservation, which is carried through to the next column for informational purposes, but is not necessary to compensate for the loss of waters of the U.S. associated with the proposed action. | | Additional PM comments: | none | |

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

| Functions (Column A) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | ++ |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: -0.3
 PM Justification: Mitigation site watershed setting and existing water source would provide greater functions and services than the impact site.

| Function (Column E) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | + |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: 2.5
 PM Justification: Mitigation site location and water supply provides moderately greater functions and services; however, this mitigation column is for buffer rehabilitation and requires a greater starting ratio.

| Function (Column B) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | ++ |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: -0.3
 PM Justification: Mitigation site watershed setting and existing water source would provide greater functions and services than the impact site.

| Function (Column F) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | + |
| Subsurface water storage | + | + |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: 3
 PM Justification: Mitigation site location and water supply provides moderately greater functions and services; however, this mitigation column is for buffer enhancement and requires a greater starting ratio.

| Function (Column C) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | ++ |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: -0.3
 PM Justification: Mitigation site location and water supply provides moderately greater functions and services; however, this mitigation column is for buffer reestablishment and requires a greater starting ratio.

| Function (Column G) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | ++ |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: -0.3
 PM Justification: Mitigation site watershed setting would provide greater functions and services than the impact site. Reconnection of ephemeral streams provides additional functional lift to overall system.

- Instructions:
1. Descr be amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be
 2. Note: alternate lists of functions may be used.
 3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

| Function (Column D) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | + |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: 2
 PM Justification: Mitigation site location and water supply provides moderately greater functions and services; however, this mitigation column is for buffer re-establishment and requires a greater starting ratio.

| Function (Column H) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | + |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: 4
 PM Justification: Mitigation site location and water supply provides moderately greater functions and services; however, this mitigation column is for uplands enhancement and requires a greater starting ratio.

| Function (Column I) | Impact site | Mitigation site |
|---|-------------|-----------------|
| Short- or long-term surface water storage | + | + |
| Subsurface water storage | + | ++ |
| Moderation of groundwater flow or discharge | + | + |
| Dissipation of energy | ++ | ++ |
| Cycling of nutrients | + | + |
| Removal of elements and compounds | + | + |
| Retention of particulates | + | + |
| Export of organic carbon | + | + |
| Maintenance of plant and animal communities | ++ | ++ |

Adjustment: 2.5
 PM Justification: Mitigation site location provides moderately greater functions and services; however, this mitigation column is for channel enhancement and requires a greater starting ratio.