**Stream/Waterway Worksheet**

Will the Permit Boundary be closer than 50-feet from the edge of the high water mark (i.e. a channel or area outside a channel that contains evidence of repeated water flow – cut banks, knickpoints, scour, bedload deposits, debris lines, etc.) or surface water feature? **[ ] Yes [ ] No**

If **No**, this worksheet does not need to be used. Do not use it or turn it in with your application.

If **Yes**, use this worksheet.

The term “defined channel” has been used in this worksheet to help operators understand what type of feature could carry water flow, but specifically applies in the Opencut Act and Rules for a Standard application. Any feature that could carry water flow and produce a high water mark applies to both the Dryland and Standard application. Often this high water mark is simply a defined channel.

The parameters of this Surface Water Worksheet must be followed to ensure a viable permit and productive postmining land use.

# Site Specific Information:

1. **Operator Name:**
2. **Site Name:**

Note: Operator Name and Site Name must exactly match the Operator and Site name on the Standard or Dryland Permit and other application documents.

1. Indicate the type of stream/waterway that would be impacted by the Opencut operation.

**[ ] Drainage [ ] River [ ] Stream/Creek (intermittent or perennial) [ ] Pond/Lake [ ] Wetland**

**[ ] Irrigation Canal**

**[ ] Other Surface Water Feature with High Water Mark/Defined Channel (describe):**

1. Is this a Dryland or Standard application?

If **Standard,** skip to #5. If **Dryland**, answer #4 completely and do not proceed further.

**DRYLAND APPLICATION**

§ 82-4-432(1)(b)(i), MCA does not allow for a Dryland permit to affect ground water or surface water, including intermittent streams, perennial streams, or water conveyance facilities. In addition, ARM 17.24.227(1)(a) states that a Dryland opencut mining operation must not affect surface water, including but not limited to, perennial or intermittent streams; and ARM 17.24.227(1)(b) states that permit boundaries must be a minimum of “50 feet from the edge of the high water mark or surface water, or as otherwise approved by the Department, including but not limited to, perennial or intermittent streams.” For the sake of this worksheet, the setback distance can be measured from the edge of the “defined channel” unless another high water mark feature is readily identifiable and wider.

Therefore, a Dryland application cannot be used if any surface water is located within the proposed permit boundary and/or water would flow within or into the permit boundary. A Dryland site cannot intersect or include a feature that would contain or carry water within its permit boundary.

**Note:** Mining a topographic high (i.e. the top of a knob, terrace, etc.) that has swales is usually acceptable if located at the upper end of a drainage/watershed area where there is going to be little or no unmitigated onflow into the proposed boundary. However, if a site is located in a landscape position where enough watershed exists above the site and flows in swales from storm events, snow melt, etc. is expected or has created evidence of repeated flow, then a 50-foot buffer is required. Alternatively, the Operator will need to complete this worksheet to detail how water will not be affected.

If this is a Dryland site, the proposed permit boundary of a Dryland site cannot intersect or affect water. Conducting opencut operations closer than 50-feet from the edge of the high water mark or surface water (i.e. a channel or area outside a channel that contains evidence of repeated water flow – cut banks, knickpoints, scour, bedload deposits, debris lines, etc.) is not recommended and the easiest alternative is to keep a minimum of a 50-foot setback/buffer from the edge of any surface water and/or from the edge of the high water mark where any water may flow.

**If the proposed Dryland Opencut permit boundary is closer than 50-feet from a high water mark, fill in the below information:**

* Provide the buffer/setback distance from the permit boundary to the high water mark of the water feature, and show its location on a map\*:
	1. **[ ] Drainage:** Setback from edge of high water mark = **ft.**
	2. **[ ] River:** Setback from edge of high water mark= **ft.**
	3. **[ ] Intermittent or Perennial Stream:** Setback from edge of high water mark = **ft.**
	4. **[ ] Pond/Lake:** Setback from high water mark = **ft.**
	5. **[ ] Wetland:** Setback from wetland = **ft.**
	6. **[ ] Irrigation Canal/Ditch: Setback from edge of Canal/Ditch =       ft.**
	7. **[ ] Other:**

Setback = **ft.**

* 1. **Provide** a detailed explanation of how the above checked features will be fully protected to ensure compliance with § 82-4-432(14), MCA & ARM 17.24.228 (e.g. existing permanent separation, significant topography, berming, other).

**Explanation:**

\*In addition to the description above, **provide a map or maps** to show the proposed permit boundary, high water mark of feature and setback/buffer distance (i.e. site map, reclamation map, etc.)*.*

**-----END OF DRYLAND SECTION-----**

**STANDARD APPLICATION**

1. This worksheet provides recommendations regarding Opencut operations proposed to be conducted in any river, creek, perennial or intermittent stream, or any other waterway with a high water mark and/or defined channel, hereafter referred to as “waterways”.

The purpose of this form is to ensure that waterways intersected by Opencut Operations are mined/disturbed in a manner that allows for the flow to be continuous or appropriately managed, to ensure Opencut sites that intersect these waterways can handle the flow carried by them (i.e. ensure the site is stable, soil storage is safe, etc.), and for reclamation to a successful postmining land use [§ 82-4-403(8&14), MCA].

**Note:** Mining a topographic high (i.e. the top of a knob, terrace, etc.) that has swales is usually acceptable if located at the upper end of a drainage/watershed area where there is going to be little or no unmitigated onflow into the proposed boundary.

This worksheet is required in situations where the Operator is conducting opencut operations closer than 50-feet from the edge of the high water mark or surface water (i.e. a channel or area outside a channel that contains evidence of repeated water flow – cut banks, knickpoints, scour, bedload deposits, debris lines, etc.). This worksheet is also required when water would flow through the site’s permit boundary. Such water flow and volume could be impactful to reclamation of an Opencut site. Opencut recommends the operator submit a *Request for Pre-Application Meeting* form to address any unknowns or concerns.

In addition, Opencut operations conducted in waterways with high water marks and/or defined channels could have the potential to cause adverse impact to the site and adjacent land. For example, disturbing a waterway/drainage with a high water mark and/or defined channel by removing vegetation and material could exacerbate lateral channel migration and erosion on-site; and changing the channel shape, dimensions, or gradient could cause both headward erosion upstream and excessive sedimentation downstream, thereby hindering, or negating reclamation. Mining too close to a channel and creating a mine floor lower in elevation than the channel itself can result in avulsion into the Opencut operation, potentially re-routing the streamflow through the site, changing the characteristics of the waterway, causing loss of materials such as soil, and changing the intended reclamation plan and/or postmining land use.

The Department recommends Opencut operations avoid mining or other operations within any waterway/defined channel and/or high water mark and that at least a 50-foot wide buffer zone along both sides of the waterway/defined channel and/or high water mark be left undisturbed. This buffer may be smaller than 50-feet depending on existing easements, the size and significance of the waterway/defined channel and/or high water mark, the relative topographical relief between the operations and the waterway/defined channel and/or high water mark, and other potential factors.

Regardless, any planned buffer zone and any crossings must be shown on the Site Map if located within the permit boundary or a located along an access road included in a permit.

**Alternatively, the operator may choose to adjust the proposed permit boundary so that the waterway is entirely excluded by at least 50 feet, thus negating the need to complete and submit this form.**

Under the Opencut Mining Act and its implementing rules, it is the Operator’s responsibility to provide a complete, thorough, and comprehensive design for the proposed operations, mitigations, and reclamation methods, and to provide adequate bond to ensure that the reclamation plan designed around the various features and factors associated with the waterway can be achieved.

**If operating closer than 50-ft of a waterway, address the below in detail:**

1. By signing and submitting this form, the operator agrees to, in accordance with their permit, leave reclaimed surfaces and roads in a stable condition that blend into the surrounding topography and allow for the waterway/defined channel to continue its flow downstream similar to pre-mine conditions [ARM 17.24.219(1)(c))].

Note: It can be acceptable to mine through waterways and this worksheet in conjunction with the application can help describe an acceptable mine plan and reclamation of the site to a stable, productive postmining land use.

1. Reclaimed waterways/defined channels must be located in their approximate pre-mine locations; or if relocated, a design must be submitted that shows the relocated channel will be of appropriate dimensions and remain stable.

Will Opencut operations disturb/impact the waterway/defined channel? **[ ] Yes [ ] No**

If **Yes**, skip to “b” below.

* 1. If **No**, Operations at this site will not impact the waterway, but would be conducted closer than 50-feet from the waterway. Therefore, address this question and do not proceed further in this worksheet.

State the setback to be maintained in section D2-3 of the Standard application and describe here how the defined channel will be protected to ensure it is not disturbed or impacted (e.g. berming, erosion control, other):

* 1. If **Yes,** will the waterway/defined channel be re-routted or re-constsructed or will opencut operations create a depresssion that captures flow before discharging it down the orignal waterway/defined channel.

**[ ]** A depression would be created that captures flow. Skip to “c” below.

**[ ]** The waterway/defined channel will be re-routed or re-constructed. Skip to “d” below

* 1. Depression capturing flows: (ARM 17.24.219(1)]
		1. Describe in detail how the flow captured by the site would be managed by providing a detailed description of the methods that will be used to prevent erosion and/or head-cutting where water enters the depression:

* + 1. Describe in detail how the flow captured by the site would be managed by providing a detailed description describing how scouring and erosion will be prevented where it leaves the depression and returns to the natural channel when/if the depression fully fills with water.

* 1. If the channel is re-reouted or re-constructed, answer the below bydescribing **in detail** how flows will be maintained through the site in the impacted/disturbed waterway/defined channel. This will require that the carrying capacity of the re-constructed and/or re-routed channel be calculated as well as the flow rate for a 100-year flood event to ensure that the channel can carry flow within its defined channel/high water mark.
		1. Describe how the channel will be re-routed or re-constructed (show existing and proposed waterway/defined channel on site map):

* + 1. **Calculations to determine the flow rate of a 100-year storm event generated from the watershed feeding into your site**:
			1. How large is the watershed in acres (show delineated watershed on map)? acres
			2. Provide the flow rate through the site for the 100-year event in cubic feet per second? Note: you must use Time of Concentration (Tc) to calculate this. Attach or provide calculations supporting the flows:
				1. Flow Rate through the Site = cubic feet per second (cfs)
				2. Description:

* + 1. **Calculations for constructed channel flow rate** (Note this flow rate must be larger than the flow rate calculated above for the watershed):
			1. Width of bottom of waterway/defined channel to be constructed:  feet
			2. Depth of waterway/defined channel to be constructed:  feet
			3. Provide/attach a cross-section of the channel to be constructed:

* + - 1. Using the above data, provide the flow in Cubic Feet per Second (cfs) that the constructed channel will contain/convey:  cfs
	1. Describe in detail how the flows through the site would be re-connected to undisturbed downstream waterways/defined channels in a stable manner to prevent scouring, erosion and head cutting both within and outside the permit boundary [ARM 17.24.219(1)].

1. When Opencut operations will cause the diversion, capture, or use of water, the Operator should consult with the regional office of the Department of Natural Resources and Conservation, Water Resources Division, concerning water rights to ensure their plan does not disrupt or impact the water rights of others.

Agencies that may require permits for impacting streams and waterways include but are not limited to:

* 1. Montana Department of Environmental Quality (DEQ) Water Protection Bureau
	2. Montana Department of Natural Resources and Conservation (DNRC)
	3. U.S. Army Corps of Engineers
	4. County Floodplain Administrators
	5. Soil and Water Conservation Districts of Montana