

**Rural and Natural Resource Lands  
Advisory Committee**

**Mineral Focus Group  
Final Report**

## MEMORANDUM

TO: Rural and Natural Resource Advisory Committee

FROM: Mineral Focus Group

SUBJECT: Final Report

DATE: January 14, 1994

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This document is the final report of the Mineral Focus Group. It contains the following elements:

### **Classifying and Designating Mineral Resource Lands**

This section includes background information and a summary of the delineation methodology.

### **Comprehensive Plan**

This section provides management policies for mineral resource lands.

### **Zoning Code**

This section covers intent and purpose, permitted and conditional uses as well as development policies and standards for mineral resource lands. The Focus group did not spend much time in this area (some areas are blank or just highlight issues that need to be discussed in the future), due in part to DNR revising some of their work and the county is revisiting existing regulations due to the recent mineral legislation that was passed.

### **Termination of the Mining Designation**

The Focus Group identified a need to develop a process for and identification of future land use designations for those areas designated as Mineral Resources. The group recommended the designation (not the continued use of Surface Mining Overlay) of existing active sites and proposed sites with the use of an overlay system for reclamation. The group did not suggest future land uses for reclamation but rather left that to the other groups. Therefore future land uses would be based on adjacent uses. Many of the proposed mining areas have also been identified as as either Forest or Agricultural areas as well.

### **Criteria for Designating Mineral Resources**

The Focus Group recognized that due to limited geological information that all mineral sites may not have been identified and therefore developed some basic criteria that would need to be addressed in requesting a land use change in the

future as information was provided by those interested in designating other mining sites. A matrix was also developed to help frame the issues that need to be addressed.

**Land Use Scenarios**

The Focus Group developed a series of scenarios to be incorporated into the required Environmental Impact State.

## CLASSIFYING AND DESIGNATING MINERAL RESOURCE LANDS

### BACKGROUND

Clark County currently administers mining through the Surface Mining Combining District. This is an overlay zone that can be combined with any other zone district, such as Agriculture or Rural Residential and also have some surface mining combined with urban residential zones. The ordinance identifies the extraction of sand, gravel, and minerals as a use permitted outright in the District, but requires a conditional use permit through the public hearing process for related activities such as rock crushing, asphalt mixing and concrete batching. The ordinance also established performance standards addressing hours of operation, compliance with state noise limitations, slopes, drainage and reclamation requirements, etc.

The ordinance was adopted in 1980 as part of the countywide rezoning effort to implement the Comprehensive Plan of 1979. Uses legally established prior to that time have a grandfathered right to continue as nonconforming uses. When implemented, this combining zone was applied to all existing gravel pits, whether active or inactive, as well as to unmined sites for which the owner indicated an intent to mine.

The designation and conservation of significant mineral resource lands within Clark County is required by the 1990 State Growth Management Act. Section 17 of the Act states that " each county .. shall designate where appropriate... mineral resource lands that are not already characterized by urban growth and that have long term significance for the extraction of minerals." The Act defines "minerals" as gravel, sand, and valuable metallic substances.

There are three key issues to the designation and conservation of mineral resource lands: These issues include:

1. defining what types of mineral resources are potentially significant in the County;
2. defining the extent and longterm significance of aggregate that is needed to meet the demand of the County's projected population; and
3. determining how to balance a variety of land uses within mineral resource areas.

Information gathered from the Washington State Department of Natural Resources and U.S. Bureau of Mines indicates that the only mineral resources within Clark County are sand, gravel and crushed rock. Sand and gravel are used as round rock aggregates in concrete, as drain rock or as crushed rock. Crushed rock is used to

produce road base or asphalt aggregate. Both types of aggregate function mainly to reduce the amount of cement and tar used in concrete and asphalt.

The Community Framework Plan which was adopted by the BOCC in April 1992 was formulated to respond to a longer time span and greater population than the 20 year GMA planning horizon. The Community Framework Plan identifies a 50 year population of approximately 500,000 people, almost double the existing population countywide. DNR also suggests using a time span of approximately 50 years in assessing whether a particular site meets the criteria. DNR recommends using 15 tons per capita per year. For analysis purposes, DNR recommends using two tons per cubic yard and 80,000 cubic yards per acre of the resource.

Based on DNR suggested tonnage criteria there will be a need for approximately 1900 acres if a 50 foot deposit or double the acreage if only a 25 foot deposit of minerals. This is also based on a minimal amount of export of minerals outside Clark County. The Clark County Aggregate Industry Alliance recently completed a study in an attempt to forecast the need for aggregate in the next 20 years based on existing inventory. The "moderate demand" scenario which is based on an increase in per capita aggregate uses but elimination of aggregate exports and imports indicates a need for approximately 27 million short tons of sand and gravel and a similar amount for crushed rock for a total of approximately 54 million tons.

### Clark County Aggregate Forecast Scenarios

<u>Scenario</u>	<u>Resource Supply and Demand (in short tons)</u>		
	<u>Sand &amp; Gravel</u>	<u>Crushed Rock</u>	<u>Total</u>
Current Resource Available ('92)	23,974,000	7,455,000	31,429,000
Less Forecast Demand (1992-2013)			
Maximum Demand	76,015,476	51,892,251	127,907,727
Moderate Demand	52,255,444	35,191,443	87,446,887
Minimum Demand	44,470,035	29,827,165	74,297,200
Surplus/Deficit at 2013			
Maximum Demand	-49,738,476	-43,002,251	-92,740,727
Moderate Demand	-26,672,922	-26,826,816	-53,499,738
Minimum Demand	-18,887,512	-21,462,539	-40,350,051
Year of Resource Depletion			
Maximum Demand	2001	1997	1999
Moderate Demand	2004	1999	2002
Minimum Demand	2005	1999	2003

Source: E.D. Hovee & Company, March 1993.

## I. CLASSIFICATION OF POTENTIAL MINERAL RESOURCE LANDS

An important step in this process was to identify potential mineral resource lands of long-term commercial significance. This was based heavily on the criteria in the DCD guidelines (WAC 369-190). The DCD classification criteria are intended to ensure resource conservation in a manner that also maintains a balance of land uses. The DCD guidelines encourage the classification of known and potential mineral resources so that access to resources of long-term commercial significance is not knowingly precluded.

The DCD guidelines state that " other proposed land uses within (mineral resource areas) may require special attention to ensure future supply of aggregate and mineral resource material, while maintaining a balance of land uses". Special attention may include notification of property owners surrounding a designated mining site and a limitation on nuisance claims by surrounding property owners.

Washington Administrative Code 365-190-070 outlines the criteria to be used to identify and classify aggregate and mineral resource lands. The following is a list of this criteria followed by its application within Clark County.

1. General land use patterns in the area - Mineral resource lands, except existing mining sites within the Urban Growth Area, should be located outside the UGA. Areas characterized by residential development are not considered to be appropriate for long-term mineral extraction. Initially, the group used the 1979 UGB which provided for urbanization between Vancouver and Camas. However, the area within the vicinity of Fisher Swale was not included within either the Vancouver or Camas IUGA and the group made the recommendation to designate approximately 80 acres adjacent to existing mining sites within the English Pit area.
2. Availability of utilities - Mineral resource lands, except some existing mining sites within the UGA, should be located in areas that do not have public water, sewer, or other urban level of public services available. Such services are conducive to urban development. which is generally incompatible with mineral extraction.
3. Surrounding parcel sizes and surrounding uses - (See #1) Mineral resource lands are primarily in areas that have existing agriculture, forestry or low density residential uses ( one dwelling per 5 acres or less) which are generally compatible with mining operations.
4. Accessibility and proximity to the point of use or market - A mineral resource site is generally expected to locate within a 20 mile radius of the point of use or market. Majority of proposed sites are within the 20 mile radius but

may take longer with regards to travel time vs. distance. This is especially true for quarry rock as it is predominately found within the forest lands.

5. Physical and topographic characteristics of the mineral resource site - This does impact the potential mining ability of some sites to the topographic within the county. The location of geologic hazard areas such as active, potential and historical unstable slopes were part of the criteria to assessed proposed future mining sites. This issue would also be addressed during the EIS process.
6. Depth of the resource - This varies depending on the location of the mining site. Along the East Fork and Main Branch of the Lewis River, the thickness of the deposits vary, but on the terraces they are approximately 30 to 60 feet thick. The sand and gravel found in the southern half of the county (Orchards, East Mill Plain) are some of the most important deposits in the county with little overburden and a resource depth beyond 50 feet.
7. Depth of the overburden - This also varies throughout the county depending of the location of the site. In the southern portion of the county and in an area north of Ridgefield currently being mined there is little overburden as well. The changes throughout the county and will become more of an issue in the future as the sites delineated as "potential mining sites" indicates a greater amount of overburden.
8. Physical properties of the resource including quality and type - The quality of gravel is determined by the age of the deposit, type of rock, and degree of weathering or soundness. Within Clark County, sand and gravel deposits which may be commercially developed are not abundant. Of all known sand and gravel deposits in Clark County, only a small percentage is known to be of commercial quality.
9. Life of the resource - The mineral resource land base within Clark County appears to be limiting and may not be able to meet future demands this is due in part to two main reasons: (1) one of the largest deposits in the Mill Plain & Orchards area is rapidly urbanizing leading to conflicts with mining extraction and (2) the East Fork Lewis River has high quality aggregate but has a number of environmental limitations.
10. Resource availability in the region - There are a number of potential mineral resources within the region which includes those deposits within the Portland Metro area. Because of its location at the confluence of two major river system, aggregate materials can be imported into the Portland area with relative ease. Significant supplies exist in eastern Washington and Oregon, along the Columbia River.

## II. MAPPING CRITERIA FOR MINERAL RESOURCE LANDS WITHIN CLARK COUNTY

Those areas meeting the following criteria are considered potential mineral resource lands of long-term commercial significance.

Mineral Deposits - Existing deposits consist of sand, gravel and rock as shown as provided by DNR information for Clark County using G.I.S information.

Location - Except for existing mining sites within the Urban Growth Area, classified lands are located outside the UGA, public parks and residential areas with existing densities primarily higher than 1 dwelling unit per 5 acres.

Land Use - Existing use in the area is mining, agriculture, forestry, vacant or very low density residential and not within environmental sensitive areas.

Area size - Proposed areas are 80 acres or more with a 40 acre parcel or two 20 acres at a minimum, except for existing mining sites or overlay areas which vary in size.

### Designated Mineral Resource Lands within Clark County

Designated resource lands include mining sites under an existing permit that are not depleted and any future site identified through the aforementioned process. The group recommended the designation (not the continued use of Surface Mining Overlay) of existing active sites and proposed sites with the use of an overlay system for reclamation. The group did not suggest future land uses for reclamation but rather left that to the other groups. Therefore future land uses would be based on adjacent uses. Many of the proposed mining areas have also been identified as either Forest or Agricultural areas as well.

### **Purpose**

The primary purpose of this class is the classification for long-term commercially significant aggregate resources. The site must contain mineral resources which are minable, recoverable, and marketable under the technologic and economic conditions that exist at the time of application for designation or which can be estimated to exist in the foreseeable future (50 years). The economic viability of aggregate resources should take into consideration the mineral resource land's proximity to population areas, product markets and the possibility of more intense uses of the land. Activities and land uses on and surrounding these sites should be encouraged and promoted.

## Characteristics

Future mineral resource lands consist of areas with the potential for the existence of mineral resources. These areas appear to contain the resource based on the information supplied by DNR; are primarily not within environmentally sensitive areas (ie., 100-year floodplain, high quality wetland areas); and are at least 80 acres in size or which at least one 40-acre parcel or two 20-acre parcels are currently vacant.

### 1. Quarried Rock

- o No specific future sites have been identified for this type of mineral resource; however, the source for mineral is located within the **Commercial Forest Designation**. Key provisions proposed by WFPA/DNR identifies the primary land use activities within these areas for commercial forest management, agriculture, and mineral extraction.

### 2. Aggregate Rock

- o Sites have been identified throughout the county which have the potential for mining activity as characterized above. These sites will still have to go through the required permitting process.
- o Future sites not identified through this designation process may exist and the land use designation for "Mineral Resources" needs to occur prior to or concurrent with the required permitting process.

## COMPREHENSIVE PLAN MINERAL RESOURCES

Clark County's approach to the Mineral Resources Land policy document is to outline the general goal and policies for mineral resource lands that include active mining sites, potential sites and sites requested for designation by the landowner.

### Goal:

To protect and ensure appropriate use of gravel and mineral resources of the county, and minimize conflict between surface mining and surrounding land uses.

### General Policies

1. It is the policy of Clark County to conserve mineral lands for productive economic use by identifying and designating lands of long-term commercial significance consistent with the 20 year planning horizon mandated by growth management.
2. Capital improvement plans should take into consideration maintaining and upgrading public roads adequate to accommodate transport of commodities.
3. In identifying and designating commercial mineral lands the following factors should be taken into consideration: geological, environmental and economic factors; existing and surrounding land uses, parcel size and public service levels that are conducive to long-term production of mineral resources.
4. The county shall maintain an inventory of gravel and mineral resource sites. The comprehensive plan inventory shall comprise:
  - a. A list of designated sites;
  - b. A list of "potential" sites for which information about the quality and quantity of the site is not adequate to allow a determination of long term commercial significance.
  - c. A list of current sites; and
  - d. A list of old sites.
5. Encourage recycling of concrete and other aggregate minerals.
6. Encourage the use of other materials which can be substituted for mineral resources.
7. Restoration of mineral extraction sites should occur as the site is mined, consistent with requirements identified in RCW 78.44.

8. The land shall not be rezoned until the gravel or mineral resource is depleted, or reasons for not mining the site are clearly demonstrated, or the site has been reclaimed
9. Mining shall not occur within the 100-year floodplain and mining within any associated wetlands shall be subject to the requirements of the Clark County Shoreline Master Program.
10. Mineral extraction operations shall be conducted in a manner which will minimize the adverse effects on water quality, fish and wildlife, adjacent activities and the scenic qualities of the shorelines and any adverse impacts shall be mitigated.

### **Tier I**

The Tier I designation is applied to those lands which are currently capable of long-term production of natural resources such as minerals. These sites have been identified by current land use, economic viability, geology and other physical characteristics conducive to the extraction of minerals, these areas are currently identified as having a Surface Mining Overlay and/or permitted or have been designated through the focus group process and will be designated for mineral extraction.

#### Policies

1. Land use activities adjacent to mineral lands should be sited and designed to minimize conflicts with mineral activities on such lands.
2. Designated mineral operations of long-term commercial significance are not exempt from the normal environmental review process of the county or state agencies.
3. Establish standards and programs whereby residents of rural lands adjacent to designated resource lands are informed that they are locating in a natural resource area and that will be subject to normal and accepted mining practices that comply with federal, state and local regulations.
4. Prior to designation of these "potential sites" subdivisions, short subdivisions or large lot segregation shall be prohibited, exceptions may be made through a resource redesignation.
5. Expansion of existing sites should be limited to expanding the pit site and not the intensity of the operation.

6. The county shall allow continued mining at existing active sites. Expansion beyond the limits of the existing overlay shall comply with applicable best management practices and other state and county laws and regulations.

## **Tier II**

The voluntary (by landowner request) designation of other mineral resource lands, classified as Tier II will be allowed following the adoption of the plan the subsequent development and county approval of criteria which will define any additional mineral resource lands. Areas not identified as either existing or "potential" sites can, in the future, demonstrate the probability for occurrence of a mineral deposit, may be so designated upon approval of the county.

1. The policies identified in both Tier I and general policies are applicable to Tier II and subject to permit approval.
2. For potential future sites identified by an individual or company, the county shall review available information about gravel and mineral resources, and if the information is adequate, designate the site as Resource when one of the following conditions exist:
  - a. As part of the next scheduled periodic review of the comprehensive plan; or
  - b. When a landowner or operator submits information concerning the potential significance of a resource site and requests a comprehensive plan amendment.
4. The county shall judge the significance of future sites, on a case by case basis, to be given the surface mining overlay by the commercial or industrial value of the resource, and the relative quality and quantity of the resource.
  - a. The resource should be of a quality that allows them to be used for construction materials.
  - b. The resource should be of a quantity sufficient to economically justify development.
  - c. The market area for a specific aggregate source is dependent on the characteristics of the aggregate, cost of extraction, accessibility, opportunity, type of transportation, and the location of high demand areas.
5. Designation of these mineral resource lands should follow the "Criteria for Designating Mineral Resources".

## ZONING CODE

It is the intent to ensure the continued use of rock, stone, gravel, sand, earth and minerals and discourage incompatible uses consistent with the Resource policies of the Comprehensive Plan. Nothing in this section shall be construed in a manner inconsistent with the provisions of Washington State Statutes RCW 78.44 and WAC 332-18.

### Permitted

- o Extractions from deposits of rock, stone, gravel, sand, earth and minerals.
- o Extraction of rock, gravel, oil, gas, and geothermal resources, and the processing of rock and gravel, in accordance with all applicable local, state and federal regulations within the designated Tier I Forest lands.
- o Stockpiling and storage of minerals subject to Site Plan Review.
- o Building, structures, apparatus, and equipment necessary for the above uses to be carried out; subject to Site Plan Review.
- o The extraction and processing of minerals on sites no greater than two acres for the purposes of construction and/or maintenance for timber management or on-site construction needs.

### Conditional Uses

- o Asphalt mixing, concrete batching, clay bulking and rock crushing for those sites not identified within Tier I Forest Lands.
- o The processing of oil, gas, mineral and geothermal resources within designated Tier I Forest Lands
- o Extraction of rock, gravel, oil, gas, minerals and geothermal resources, and the processing of rock and gravel, in accordance with all applicable local, state and federal regulations within Tier II Forest lands.

### Minimum Lot Size

1. Existing active sites shall be designated an "Mineral Resource and be a contiguous geographic area. When the activity includes extraction along with asphalt mixing, concrete batching, clay bulking or rock crushing, the total site shall be a minimum of 20 acres. Activities which are limited to

extractions only shall not have a minimum site.

2. Future sites designated as "Mineral Resource" shall be a minimum of 20 acres within a contiguous geographic area.
3. Lands rezoned to "Mineral Resource" may be reviewed as deemed necessary by the planning division and at intervals not to exceed 10 years to determine whether substantial changes in the comprehensive plan and local conditions beyond any such developments anticipated in granting the zone have occurred, and to consider the current mineral status of the land, all to determine whether a rezone to another classification is warranted.

## Development Policies and Standards

- o The quality of the resource should be consistent with the requirements of the Washington State Department of Transportation addressing LA Wear, air degradation, etc.
- o The proposed site must demonstrate that there is at least 2000 tons of aggregate deposited on the site which meets the above specifications. This may be done by verifying the depth of the overburden, type of aggregates found and the depth of the resource.
- o Road Access - for surface mining operations, access on any public right-of-way shall be surfaced in accordance with County Transportation Division development standards as appropriate.
- o All access roads within 100 feet of a paved county road or state highway are paved unless the applicant demonstrates that other methods of dust control will be implemented in a manner which provides for the safety and maintenance of the county road or state highway.
- o Roads within the surface mining parcel which are used as part of the surface mining operation are constructed and maintained in a manner by which all applicable standards for vehicular noise control and ambient air quality are or can be satisfied.
- o Noise - No development or activity shall exceed the maximum Environmental Noise Levels established by WAC 173-60. (address ambient noise level by %)?
- o Hours of Operation - Hours of operation unless otherwise authorized shall be between 7 am and 8 p.m.
- o Public Safety - Owners of surface mines shall ensure that their operation(s) will not be hazardous to neighboring uses. Blasting activities shall be conducted so that the ground vibrations and fly-rock to off mine site uses are monitored and minimized.
- o Setbacks  

Excavation operations shall be permitted no closer than 75 feet from any property line, street, road or highway. Structures or buildings shall not be located closer than one hundred feet from a developed residential property line. Office buildings shall maintain a twenty-five foot setback.

- o Inspections - The granting of any permit hereunder is conditioned upon the consent of the owner to permit inspection of the site at any time. The inspection will include a review of all applicable county permits and work actually being conducted on the site. All violations shall be noted whether or not they are corrected in the presence of the inspector.
- o Erosion Control - All disturbed areas including faces of cut and fill slopes, shall be prepared and maintained to control erosion. This control may consist of plantings sufficient in amount or type to stabilize the slope.
- o Fencing - The periphery of all sites within the gross site area being actively mined or reclaimed shall be fenced according the State Department of Natural Resources' standards.

#### Termination of the Mineral Resource Zoning

- o When a mining site has been fully or partially mined, and the operator demonstrates that a significant resource no longer exists on the site, and that the site has been reclaimed subject to the approved reclamation plan, the property shall be rezoned to the subsequent use zone identified in the comprehensive plan.
- o A reclamation overlay should be developed to determine future land uses and the process for achieving these land uses. Future land use designations for terminated and reclaimed mining sites shall be based on surrounding land uses. This should be consistent with the proposed reclamation plan and permit requirements established by DNR.

## CRITERIA FOR DESIGNATING MINERAL RESOURCES

The primary reason is that the geological information required to accurately identify, evaluate and designate mineral resources of long-term "commercial" significant is limited in scope. Also, lands with the geologic potential for commercial mineral extraction once identified must also be evaluated in light of additional criteria which address factors such as land use compatibility, economic issues and environmental concerns.

The county shall analyze information about the location, quality and quantity of gravel and mineral deposits. A decision about the significance of a site shall include:

1. A survey map, tax lot map or other legal description that identifies the location and perimeter of the gravel and mineral resource; and
2. Information showing that the resource meets or can meet applicable quality specifications for the intended use(s). Information shall consist of laboratory test data or the determination of a geologist or engineer.
3. Information showing the quality of the resource as determined by exploratory test data or other calculations compiled and attested by a geologist or engineer.
4. Life of the resource, which will help to assess the needs and demands for the county with regards to mineral resources and also the impact to adjacent land uses.
5. The attached matrix should serve as a reference point for both the county and applicant to assess the feasibility of designating and protecting the mineral resource and should be tied to future land use decisions.

## MATRIX FOR ASSESSING PROTECTION OF MINERAL RESOURCES

	WRITE IT OFF	CONSIDER FOR PROTECTION	PROTECTION DESIRABLE	PROTECTION HIGHLY DESIRABLE	PROTECTION CRITICAL
<b>QUALITY OF DEPOSIT</b>	low grade deposit	variable but located near use area or processing plant	Deposit made economical to mine by upgrading material	grade meets the requirements for road construction or can be upgraded	concrete quality
<b>SIZE OF DEPOSIT</b>	small deposit	small deposit (less than 2,000 tons)	medium-size deposit.	Large deposit (7.5 million tons).	very large deposit (10 million tons)
<b>ACCESS - DISTANCE FROM MARKET</b>	More than 20 miles from use area.	Distance from use area is minimized due to access to interstate	Less than 10 miles of the use area; alternative access route available.	Large deposit presently beyond economical hauling distance to present use areas. Near highways : access can be provided.	Within 5 miles of uses area. Adjacent to highway with access for trucks;
<b>COMPATIBLE WITH NEARBY AREAS</b>	Adjacent land use presently incompatible with mining (appreciable residential development within range of excessive noise, dust, blasting, vibrations, etc.)	Scattered development within outer range of impacts of mining; owners may not object to mining.	Adjacent land suitable for development and within commuting distance of use area.	Imminent incompatible development on adjacent lands.	No incompatible land uses existing or likely in the foreseeable future (adjacent land in national forest, operator's ownership, agricultural land use).
<b>IMPACT OF NOISE</b>	Noise level in adjacent presently developed areas would clearly exceed standards if mining occurred.		Noise level in adjacent undeveloped areas would exceed standards for likely use, but use of these areas can be easily delayed or economical mitigation can be provided by barriers.		Noise at adjacent residential area less than 50 dB(A) due to distance or topographical barrier, berm can be constructed easily.
<b>IMPACT OF BLASTING</b>	Too close to existing subdivision				Blasting not required; permanent open space between quarry and other uses; topographic barrier between quarry and other land uses; only occasional light blasting; blasting compatible with adjacent uses/.

	<b>WRITE IT OFF</b>	<b>CONSIDER FOR PROTECTION</b>	<b>PROTECTION DESIRABLE</b>	<b>PROTECTION HIGHLY DESIRABLE</b>	<b>PROTECTION CRITICAL</b>
<b>IMPACT OF TRUCK TRAFFIC</b>	Only access is local road through residential area.	Slightly longer alternative route exists.	Alternative truck route can be built at reasonable expense; alternative transportation (conveyor, etc. can be sued past residential streets.		Adjacent to freeway with access to site.
<b>VISUAL IMPACT</b>	Mining would destroy or create.	Mining activity cannot be screened and would permanently alter landscape.	Some activity visible from residential areas, but no permanent deterioration of landscape.	Mining activity can be easily screened by berm and/or vegetation.	Activity screened by topography or vegetation, or appreciably reduced by distance.
<b>WATER QUALITY</b>	Within wellhead protection areas				Not within wellhead protection areas
<b>WETLANDS IMPACT</b>	High quality wetlands throughout the site	high quality wetlands only on a portion of site and can be avoided.	lower quality wetlands on site and can be mitigated	wetlands can be avoided on site	no or minimal wetlands on site and of low quality
<b>SLOPES</b>	site located in active unstable slope area	potential or historical unstable slopes	unstable slopes on site can be avoided	minimal slopes throughout the site	level grade mining site with minimal slopes
<b>BIOLOGICAL IMPACT</b>	Endangered and threatened plants or animals on-site.	Site includes prime wildlife habitat that would be permanently removed by mining.	Species of Special Concern located on site	Minor or temporary loss of wildlife habitat.	No significant biological resources; rehabilitation of site would replace or create habitat.
<b>RECLAMATION POTENTIAL</b>	Cannot be reclaimed for future uses		Meets DNR reclamation requirements		Restored to support identified future land use and potential as open space/park site.
<b>IMPACT OF FLOODING</b>	Within 100 year floodplain. Mining would cause erosion of adjacent property; could be prevented only at great expense.		Mining would create erosion hazard for roads, bridges, and utility lines; however, these structures could be strengthened at reasonable costs.		Outside of 100 year floodplain and shorelines of the county. Mining would create flood control channel and would not damage adjacent land.

## LAND USE SCENARIOS FOR MINERAL LANDS

### 1. No Action Alternative

The existing sites and overlays would remain as is. There would be no designation of sites or overlay areas. Therefore, it would be possible that the actual mining area could be reduced because of the development of lands underlying mining overlay areas. According to the study completed by Mr. Hovee for the Aggregate Alliance this would mean that the resources for both aggregate and quarry would be depleted within the next eight to ten years. However, this report did not take into account Fisher Quarry of existing county and state mining leases. These additional sites would probably increase the lifespan of the quarry resource.

### 2. Designate Existing Sites

This would be similar to the first alternative except all existing sites and overlay areas would be designated as resource lands. This would allow for more protection of the sites. However, there would still be concern about the overall supply of the resource. Much of the existing overlay areas are already being mined and much of the overlay areas not being mined appear to be in environmental sensitive areas.

### 3. Designate Existing Sites Minus Certain Areas

This alternative would be similar to the first two alternatives but would allow more review of the sites and overlays which are not appropriate as future mining areas. There are two predominant reasons for highlighting removal of some sites or areas and that would be for environmental reasons or the site has been mined out.

### 4. Designation of Existing Sites and the Use of an Overlay District for the proposed sites.

This would allow for the protection of existing sites and overlays (minus those sites or areas not appropriate for mining) and some protection for future sites. The protection of these future sites is difficult to determine, some of the proposed sites have also been identified as either or agricultural or forestry resources, which allows somewhat more protection from

incompatible land uses; other sites are closer to the urbanizing area making them more feasible but potentially causing more land use conflicts and the eroding away of the land underneath the overlay; and other sites have a distance factor which could influence their viability.

- o Based on the projected 2013 population, existing reserves for both sand & gravel and crushed rock and a moderate demand (ie., 14.5-15 tons per capita) the following tonnage is needed:

Sand and Gravel    26,672,922 tons or  
                          13,336,461 cubic yards or  
                          166.7 acres per 50 ft recoverable deposits or  
                          333.4 acres per 25 ft recoverable deposits

Crushed Rock        26,826,816 tons or  
                          13,413,408 cubic yards or  
                          167.7 acres per 50 ft recoverable deposits or  
                          335.3 acres per 25 ft recoverable deposits

- \* According to DNR:  
Average Need = 15 tons per capita  
Average Demand = 2 tons per cubic yard and 80,000 cubic yards per acre

Approximately 6000 acres has been identified through the planning effort. However, over half of that acreage is within three sites; along the Gorge, Camp Bonneville and adjacent to Lake Merwin. Based on calculations according to DNR there is a need for between a low of 1800 acres to 3600 acres depending on the depth of the deposit.

5. Designate both Existing Sites and Proposed Sites

This would provide for the most protect with regards to preserving mining ability for the future and depending on the quality and quantity of the resources within the proposed sites would allow for ability to mine beyond the 20 year planning horizon. Final calculations will occur among determination of which sites should be removed and which added.

This is the preferred scenario identified by the Mineral Focus group because it provided for the greatest protection of potential mining sites provided some existing overlay areas along the East Fork of the Lewis are either removed or recognized as having minimal mining potential due to environmental concerns.

\* WITHIN ALL SCENARIOS IT SHOULD BE POSSIBLE TO INCLUDE A PROCESS FOR ALLOWING THE DESIGNATION OF FUTURE SITES BASED INFORMATION PROVIDED BY THE OPERATOR AND THE USE OF THE MATRIX. HOWEVER, IT IS NOT POSSIBLE TO DETERMINE HOW MUCH RESOURCE WOULD BE PROTECTED. IN THE FUTURE, IT MAY BECOME MORE DIFFICULT TO IDENTIFY THESE SITES DUE TO LAND USE INCOMPATIBILITIES.