Water Pollution Control Advisory Council update on Nutrient Work Group

September 23, 2022

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Agenda

Update on Variance rule making progress

Continued dialogue with Nutrient Work Group and EPA

- **Response Variable update**
- **Decision framework for response variable data combinations**

Remaining topics for NWG meetings

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Introductions

DEQ Staff

- Michael Suplee, Water Quality Science Specialist
- Rainie DeVaney, Discharge Permitting Section Supervisor
- Amy Steinmetz, Waste Management and Remediation Division Administrator

Water Quality Standards Variance Rule Progress

Public Comment Period ended Aug 22, 2022 which included a public hearing

DEQ is finalizing rule package for projected adoption on Sept 27, 2022

Refinement of Response Variables and Associated Thresholds

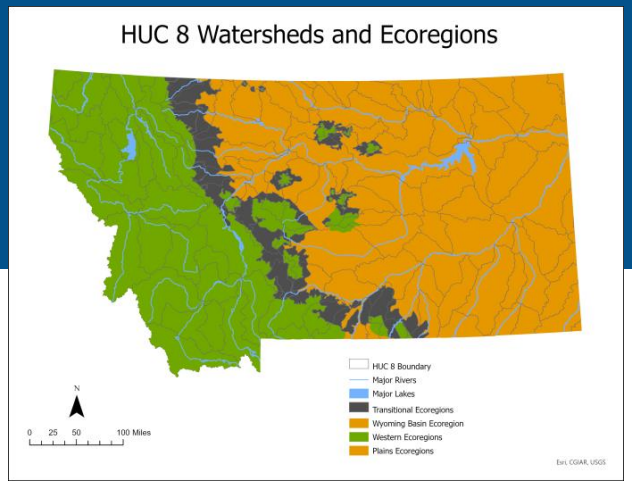
Over the past few months, DEQ and EPA met repeatedly and collaborated on response variables and associated thresholds

-Addressed issues raised in August 2021 letter from EPA

Proposed Narrative Nutrient Standards Translator for Wadeable Streams and Medium Rivers

The DRAFT translator is a matrix of causal (nutrient) and response variables. Specified response variables and thresholds are associated with specific beneficial uses and regions of the state. "**X**" indicates the variable applies. If marked with X, variable would be required to be measured at monitoring sites in an AMP monitoring plan.

			Response Variable (threshold)				
Region	**Associated Benefical Use**	**Nutrient Causal Variables (*see* nutrient concentration ranges, by ecoregion)**	**DO Delta**	**Benthic Chl*a* ; AFDW**	**% filamentous algae bottom cover**	**Macroinvertebrates**	***Notes***
Western and transitional ecoregions	Recreation	**X**		**X** (150 mg Chla/m^2; 35 g AFDM/m^2)	**X** (30% cover)		
Western and transitional ecoregions	Aquatic Life	**X**	**X** (TBD; probably ~3.0 or less)			**X** (metric, threshold TBD)	
Western and transitional ecoregions, high gradient streams (>1% slope)	Aquatic Life	**X**				**X** (metric, threshold TBD)	*Slope break based on findings in 3/19/2014 DEQ study (memo)*
Eastern ecoregions	Aquatic Life	**X**	**X** (TBD; probably ~5.0)			**X** (metric, threshold TBD)	



Data to be collected during Applicable growing seasons

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Ecoregional Ranges*

Ecoregional Zone	Ecoregion (Level III)	Ecoregion (Level IV)	Maximum Recommended Range	
			Total Phosphorus (µg/L)	Total Nitrogen (µg/L)
Western	Northern Rockies (15)	all	20 - 40	210 - 1,210
Western	Canadian Rockies (41)	all	23 - 62	325 - 821
Western	Idaho Batholith (16)	all	20 - 62	210 - 718
Western	Middle Rockies (17)	all except 17i	20 - 40	210 - 1,210
Western	Middle Rockies (17)	Absaroka-Gallatin Volcanic Mountains (17i)	61 - 105[b]	Use values from the lower end of the range for the Middle Rockies (17)
Western (transitional)	Northwestern Glaciated Plains (42)	Sweetgrass Upland (42l), Milk River Pothole Upland (42n), Rocky Mountain Front Foothill Potholes (42q), and Foothill Grassland (42r)	23 - 80[c]	445 - 775
Western (transitional)	Northwestern Great Plains (43)	Non-calcareous Foothill Grassland (43s), Shields-Smith Valleys (43t), Limy Foothill Grassland (43u), Pryor-Bighorn Foothills (43v), and Unglaciated Montana High Plains (43o)[a]	20 - 41[d]	439 - 1,125
Eastern	Northwestern Glaciated Plains (42)	all except those listed above for 42	70 - 150	540 - 1,830
Eastern	Northwestern Great Plains (43) and Wyoming Basin (18)	all except for those listed above for 43, and 43c below	70 - 150	540 - 1,830
Eastern	Northwestern Great Plains (43)	River Breaks (43c)	None recommended	None recommended

[a] For the Unglaciated High Plains ecoregion (43o), the range applies only to the polygon located just south of Great Falls, MT.

[b] Based on the 25th and 75th percentiles of the natural background concentrations in this level IV ecoregion.

[c] Lower end based on streams' origins in the Canadian Rockies; upper end based on 75th percentile of natural background for these ecoregions.

[d] Lower end based on similarity to Middle Rockies, upper end based on Elk Creek reference site.

*Subject to final review and refinement prior to rulemaking

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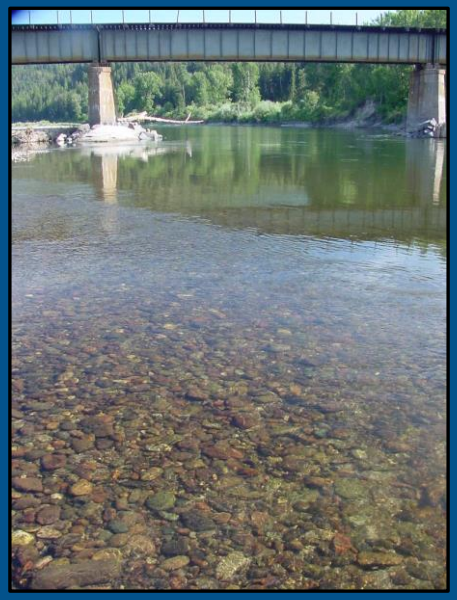
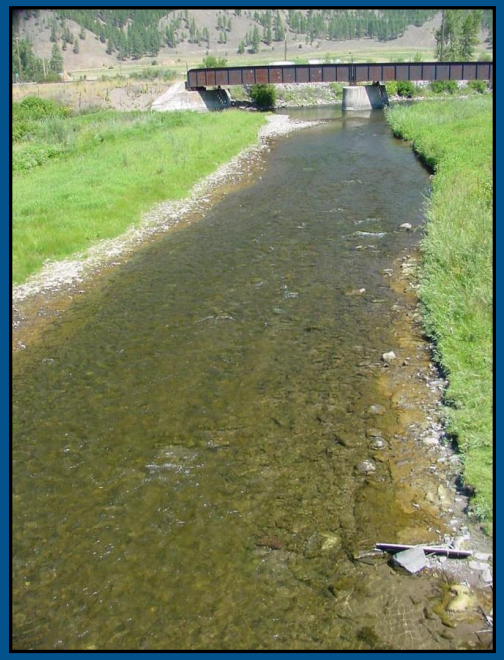
Attached algae quantified as milligrams of chlorophyll *a* per square meter of streambed (Chl*a*/m^2), AFDW (g/m^2), and % cover

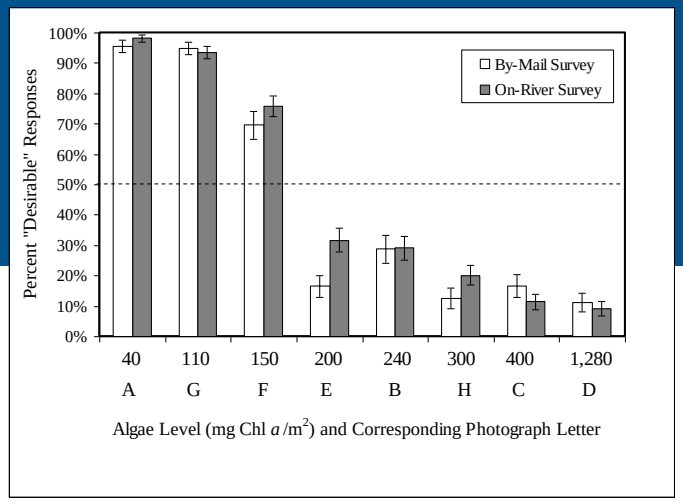


40 mg Chl*a*/m^2
10 g/m^2
~5% bottom cover



120 mg Chl*a*/m^2
~32 g/m^2
~30% cover

300 mg Chl*a*/m^2
~120 g/m^2
>60% cover



From Suplee *et al.* (2009). JAWRA 45: 123-140.

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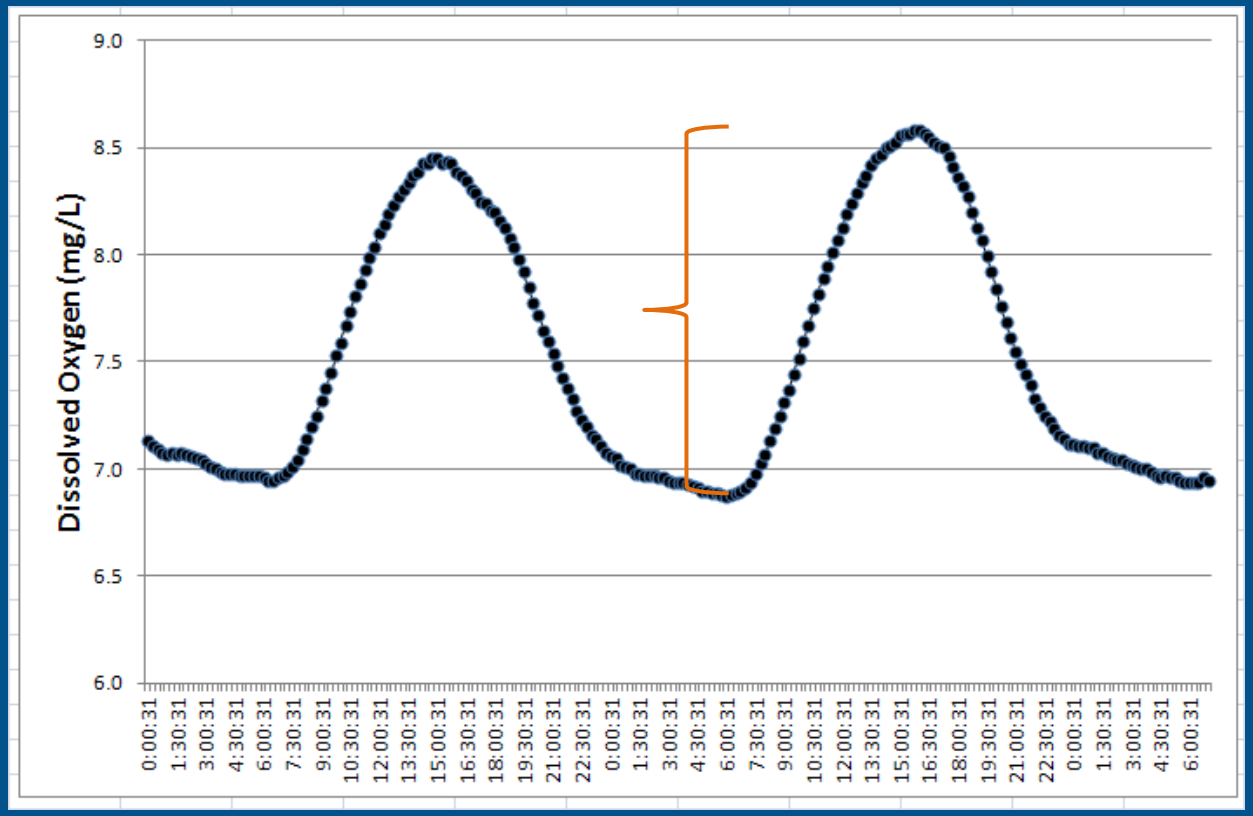
Dissolved Oxygen Delta (Daily Change): Wadeable Streams and Medium Rivers



Dissolved Oxygen Delta:
Daily High minus Daily Low

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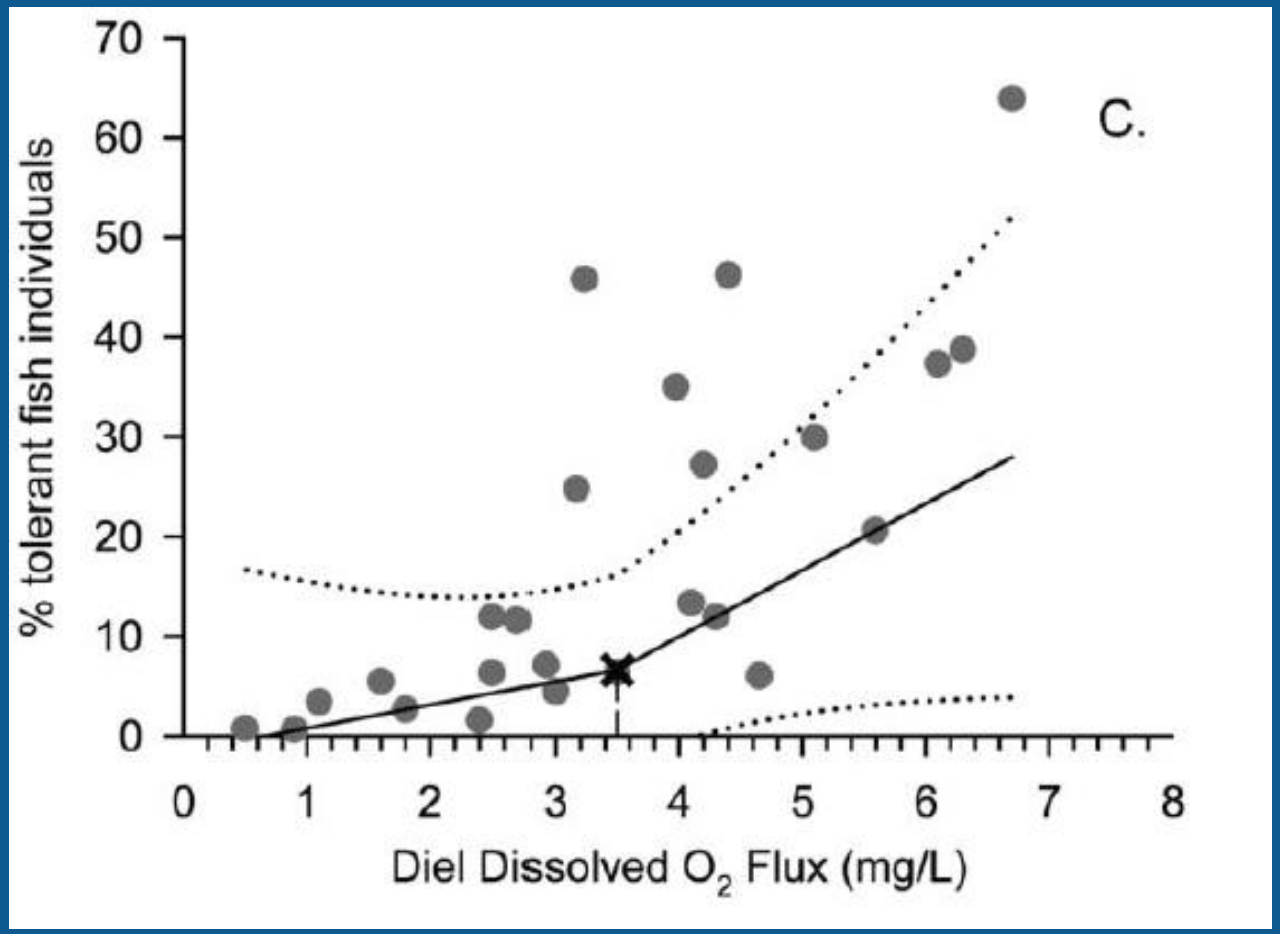

Excessive DO delta is associated with undesirable changes in aquatic life (e.g., loss sensitive fish species in Minnesota)

Figure from Heiskary and Bouchard (2015), river nutrient study.

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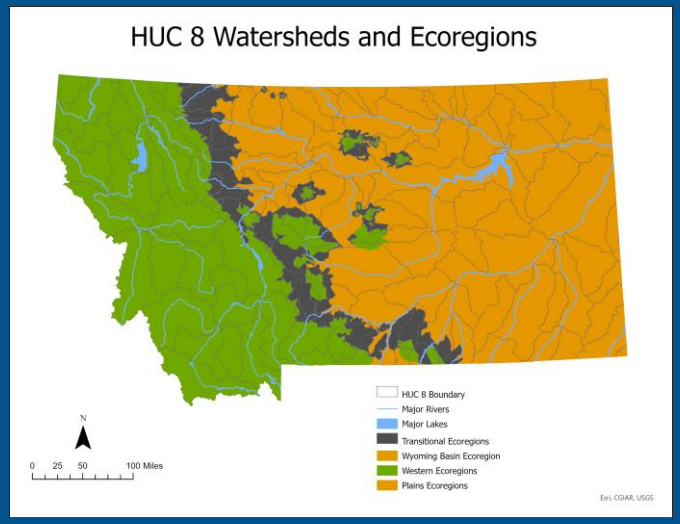
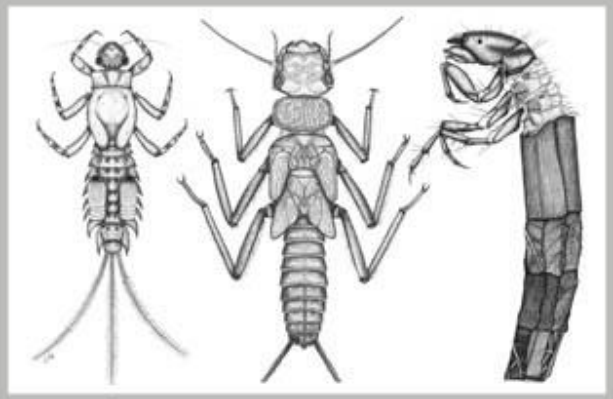
Example DO Delta Thresholds

Entity	Dissolved Oxygen Delta	Use Protected/Instream Value
MT: Assessment Method (2016)	5.3	Non-salmonid fishes and associated aquatic life
Minnesota PCA (2015)	3-4.5	Aquatic life; vary by region (4.5 similar to E. MT ecoregions)
Ohio EPA (2015)	6.5	Trophic Condition Status, per Stream Nutrient Assessment Procedure



Wadeable Streams & Medium Rivers: Macroinvertebrates



- Direct measure of the aquatic life beneficial use; respond to eutrophication in weeks/months; easy to collect, several taxonomic contractors available

- Responsive to eutrophication in western and eastern Montana
  - HBI part of nutrient assessment method since 2010
  - Plains metric responded to nutrient additions in eastern MT stream nutrient-dosing study

  - Different metrics and threshold needed for each part of the state
    - Metric & threshold identification would be included as part of this work

    - Goal is select the best metric responding to eutrophication for each major geographic zone

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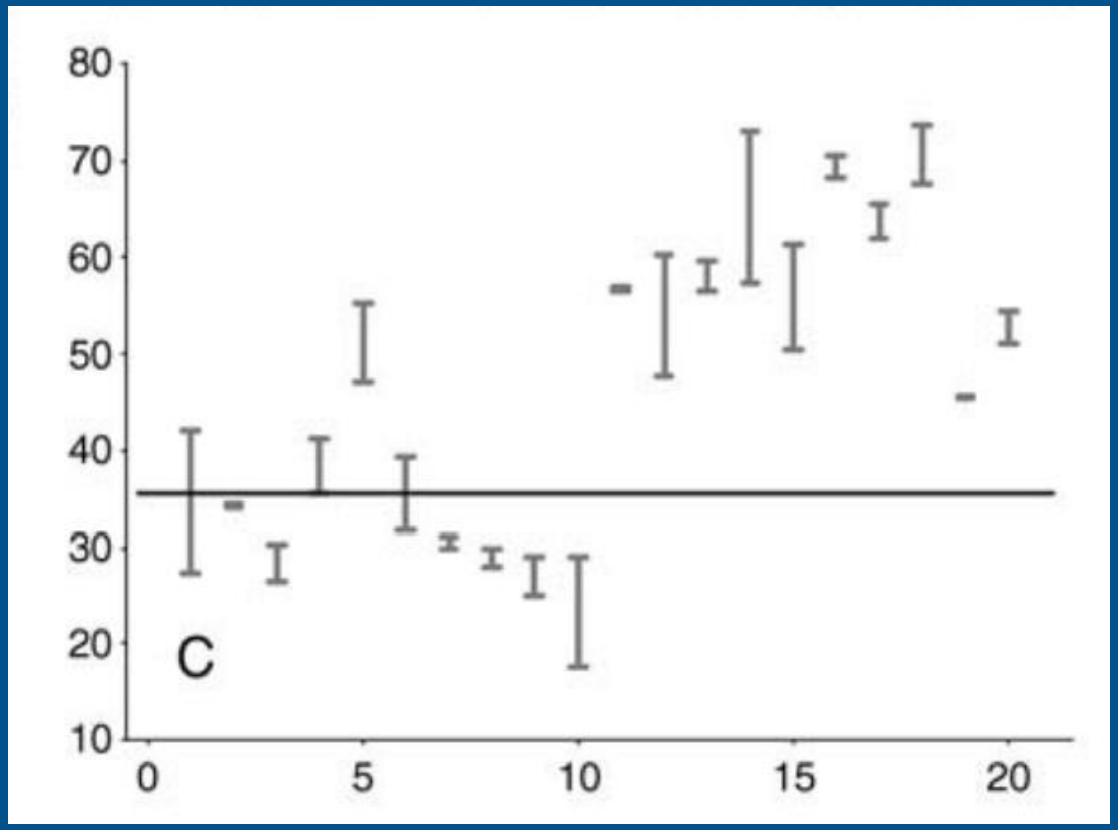
Macroinvertebrates can provide consistent assessment results (example: Plains MMI)



From Stribling *et al.* (2006). Precision of benthic macroinvertebrate Indicators of stream condition in Montana. J. N. Am. Benthol. Soc. 27: 58-67

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In the translator, if nutrient concentrations are high but the response variables are acceptable, then the standard is met

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Some combinations of results will be harder to interpret (e.g., low nutrient concentrations, acceptable DO delta, but poor macroinvertebrates score).

-A draft decision framework is under review within DEQ and will be presented to NWG

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May 2022: Updated draft Administrative Rules and Circular DEQ-15

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Remaining Topics to Discuss

- **AMP process**
- **TMDL – AMP interaction**
- Addressing EPA's technical comments in August 2021 letter on response variables and thresholds
- Translation of the narrative for all CWA programs
- AMP – MPDES permit interaction
- Reasonable potential analysis
- Nutrient assessment method process
- Protection of downstream uses
- Revised guidance document
- Final rule language
- Case study

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Next Meeting

- Nutrient Work Group
  September 28, 2022; 9-11 AM

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Thanks for Joining Us

Contact:

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Rainie Devaney, RDevaney@mt.gov

To submit comments or questions

Submit Comments or Questions

https://deq.mt.gov/water/Councils

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Permitting Process for Publicly-owned Mechanical Facilities