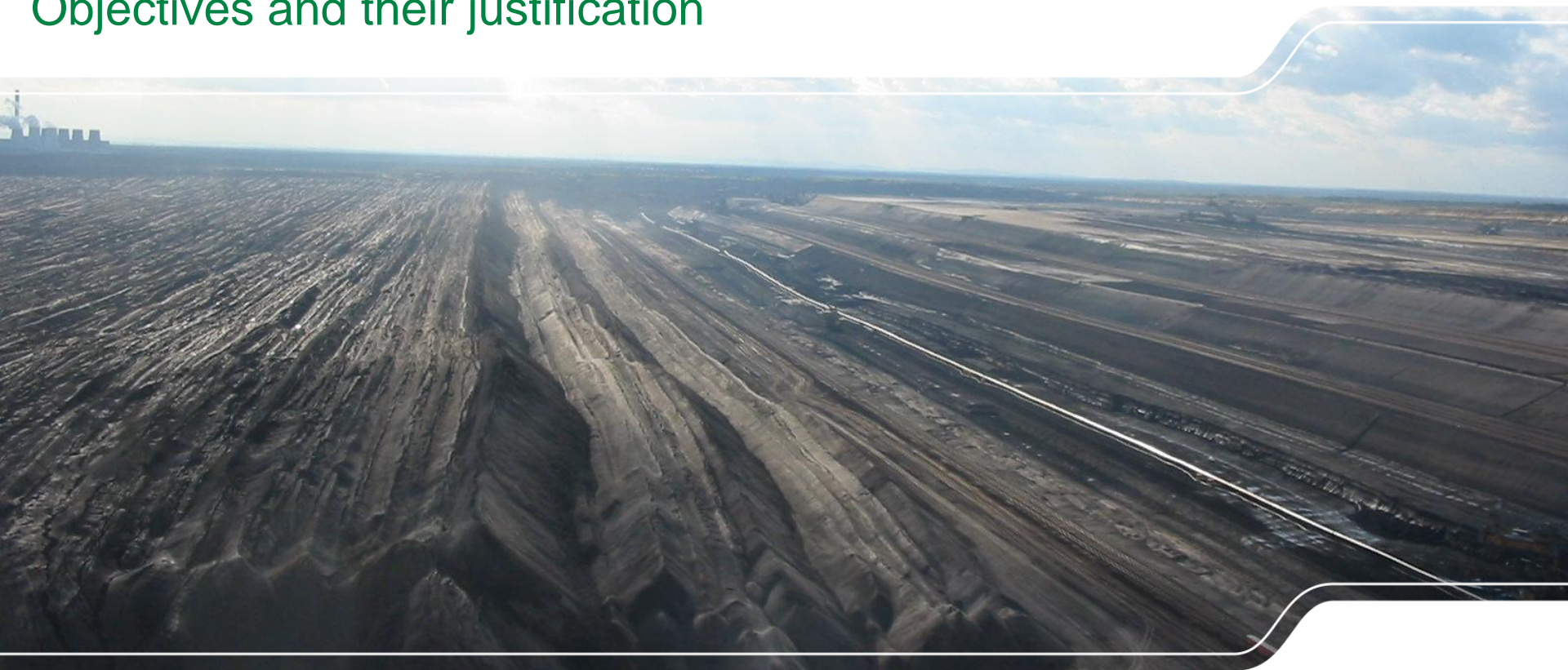


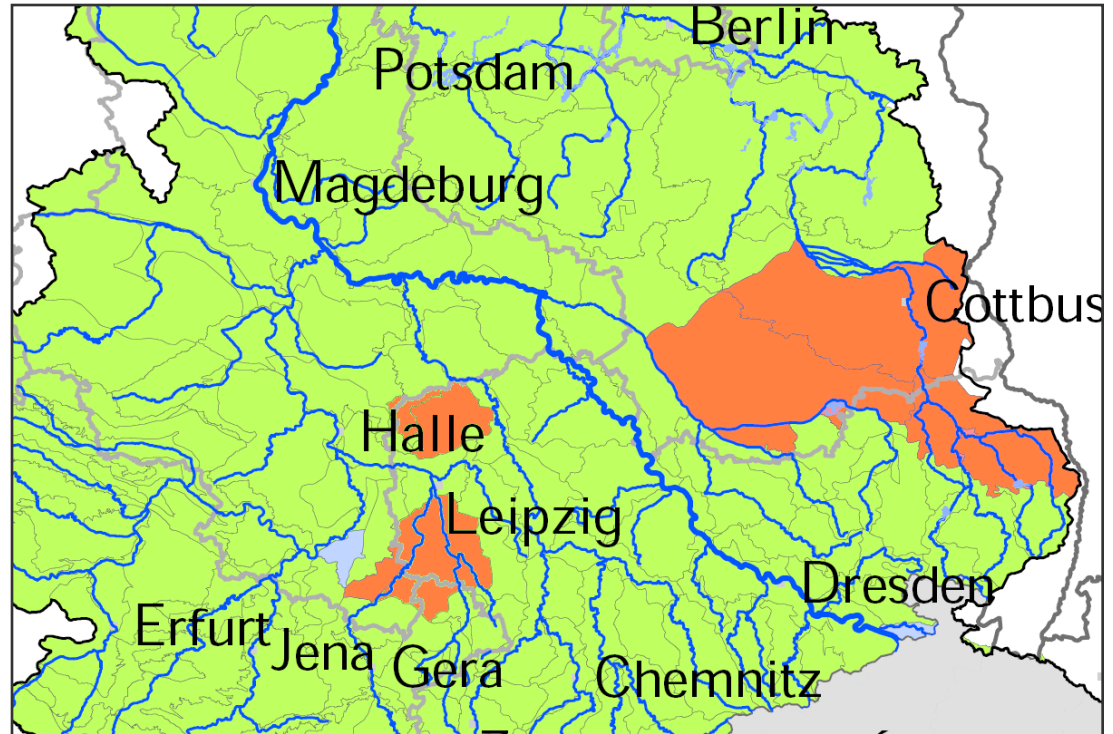
Less stringent environmental objectives for GW-bodies affected by open cast lignite mining

Objectives and their justification



Regional Situation

Mine	end of excavation (planned)	end of flooding (planned)
Cottbus-Nord	2015	2028/30
Jänschwalde	2020/25	2035/40
Welzow-Süd	2045	2070/75
Nochten	2050/55	2080/85
Reichwalde	2050/55	2075/80
Vereinigtes Schleenhain	2040	2060/70
Profen	2028	2095
Amsdorf	2025	2060



Affected GW-bodies	Middle German District	Lusatian District	
	FGE Elbe		FGE Oder
GWB total	19 (7.600 km ²)	18 (14.220 km ²)	4 (680 km ²)
thereof with less stringent objectives	4 (1.240 km ²)	5 (4.470 km ²)	3 (616 km ²)

Judicial Justification – Key Points

Conditions of Art. 4(5) and in principle of Art. 4(7) also are met

- because of the overriding public interest in lignite mining
- because a reliable and reasonably priced supply of resources and energy is necessary
- because of regional planning regulations
- from climate protection aspects
- at present there are no alternatives in energy policy and mining technics
- no deterioration of GW status is possible (all affected GW-bodies are already in poor status)

Technical Justification - Key Points

Evidence, that all appropriate measures and practical steps were taken, to mitigate the adverse impact on the status of the GW-body:

- Compilation of the possible measures to prevent or limit the impacts
- Categorisation of the GW-bodies with regard to the influence of the lignite open pit mines
- Discussion of the applicability of the measures to the GW-body-types
- Discussion of the applicability and application of the measures to the truly affected GW-bodies (exemplified)

Technical Justification – Quantitative Status

Measures

- Measure 1: Consideration of the influence of dewatering on the GW-balance when determine the mining boundaries
- Measure 2: Minimal dewatering
- Measure 3: Spacious artificial GW recharge by re-infiltration of mine drainage water
- Measure 4: Lokal GW recharge and other lokal measures without application of mine drainage water
- Measure 5: Alternative water supply
- Measure 6: Accelerated GW-table rising by flooding the pit lakes with surface water
- Measure 7: Sealing walls

Types

- M-I: Open pit mine
- M-II: Clear influence of dewatering without significant GW-dependent terrestrial ecosystems and associated SW
- M-III: Low influence of dewatering without significant damage of relevant GW-dependent terrestrial ecosystems and associated SW
- M-IV: Partial influence of dewatering with local relevant GW-dependent terrestrial ecosystems and associated SW
- M-V: Largely avoidance of GW-table lowering because of widespread relevant GW-dependent terrestrial ecosystems and associated SW
- M-VI: GW-table is already rising

Technical Justification – Quantitative Status

	Typ M-I	Typ M-II	Typ M-III	Typ M-IV	Typ M-V	Typ M-VI
Measure 1	X			X		
Measure 2	(X)	Typ is not to be found	Typ is not to be found	X	Typ is not to be found	
Measure 3	-			-		
Measure 4	-			X		X
Measure 5	(X)			X		X
Measure 6	(X)*			(X)*		X
Measure 7	X			X		

* suited for later application

Technical Justification – Chemical Status

Measure 1: Selektive tipping of overburden

Measure 2: minimisation of technologically caused oxygen exposure time

Measure 3: Addition of alkaline substrates to overburden that tends to acidification

Measure 4: Addition respiratory acting substrates at the surface of the overburden dump

Measure 5: Hydraulic barriers

Measure 6: Chemical barriers

Measure 7: Aktive/passive water treatment

Measure 8: Speedy flooding with SW

Measure 9: Geochemical investigation of the pre-mine area

Measure 10: Geochemical dump investigation

Measure 11: GW-monitoring

Measure 12: Modified water supply

C I: GW-body dominated by abandoned open cast mines

C-II: GW-body with active open cast mines and with acidification potential

C-III: GW-body with active open cast mines and without acidification potential

C-IV: GW-body in the downstream area of the overburden dumps

C-V: GW-body with active and abandoned open cast mines and with acidification potential

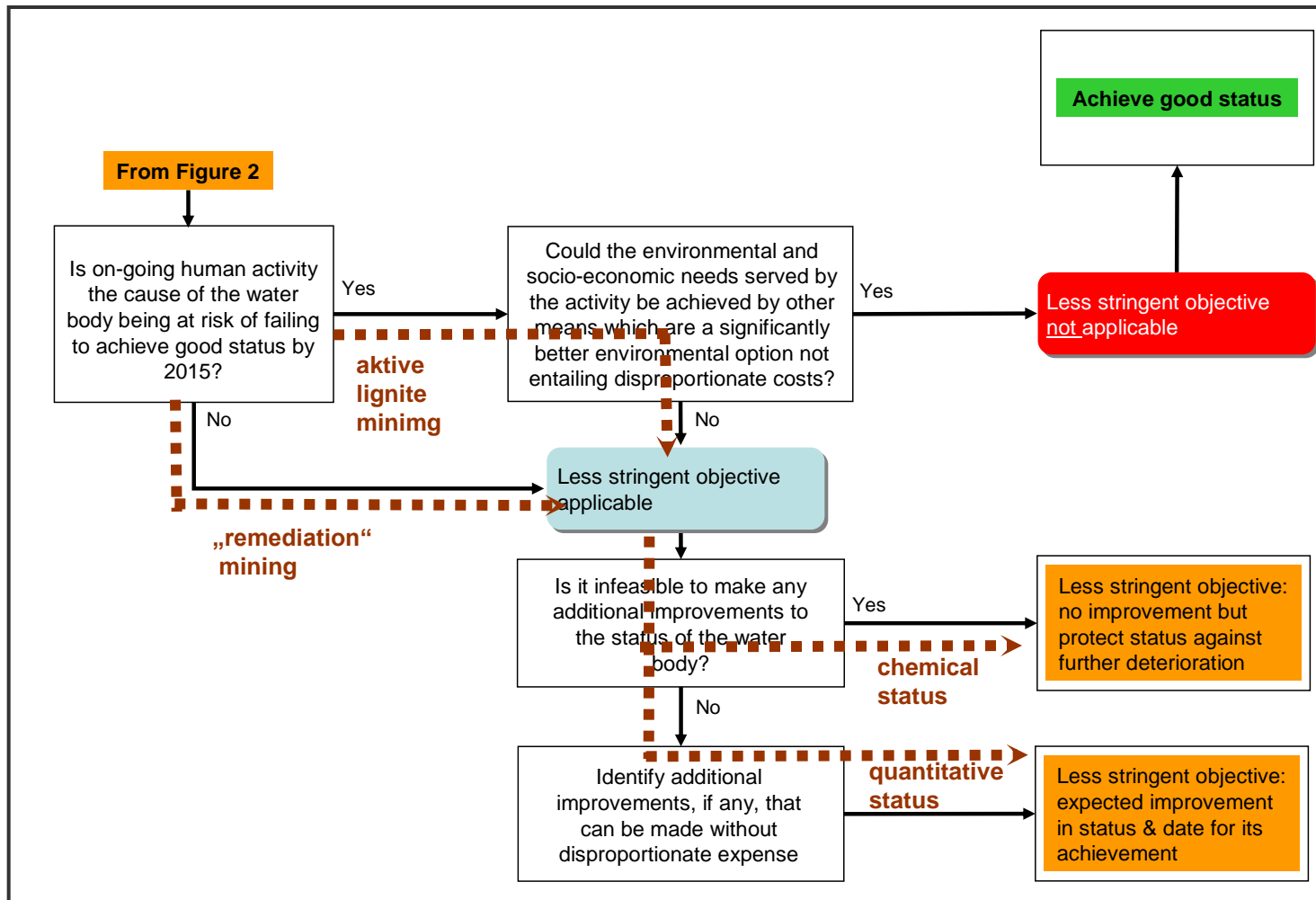
Technical Justification – Chemical Status

	Typ C-I	Typ C-II	Typ C-III	Typ C-IV	Typ C-V
Measure 1	-	X			X
Measure 2	-	X			X
Measure 3	-	X			X
Measure 4	X	X			X
Measure 5	X	-			-
Measure 6	X	-			X
Measure 7	X	-			X
Measure 8	X	-			X
Measure 9	-	X			X
Measure 10	X	X			X
Measure 11	X	X			X
Measure 12	X	X			X

Typ is not to be found

Typ is not to be found

Less Stringent Objectives



Less Stringent Objectives – Quantitative Status

- I Active lignite mining: **technologically required GW-level** according to the mining act licenses
Remediation mining: **time and area** of the planned **final GW-level** (areas and time periods between 2030 and 2055, still to be determined in detail for each GW-body)
- I **Temporary disconnection** of GW-associated SW is accepted to be **unavoidable** during dewatering phase, GW-table rising and possibly further on.
- I **Significant** GW-dependent terrestrial ecosystems could be preserved **as far as possible**.

Less Stringent Objectives – Chemical Status

- I **Sulphate** und **Iron** concentrations may exceed the **natural background level** significantly.
Upward trends in the concentration of pollutants, especially Sulphate, can not be prevented in general.
- I **Deterioration** of **SW quality** by mine drainage water and GW **is possible**.
Impacts should be **minimised** as far as possible.
As the case may be **exemptions** to the environmental objectives of SW must be established.
- I The **significant** damage of **relevant** GW-dependent terrestrial ecosystems should be prevented **as far as possible**.