

Twinning

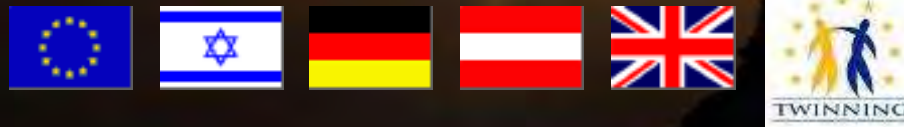
Tel Aviv

November 2016

Inspection

General – Waste water

Bernd Serr





Who is that?

- Bernd Serr, PhD
- Regional Government of Freiburg, Germany
- Permitting & inspection
- Mission No. 12 to Israel





Freiburg





Permit
Conditions
ELVs

Monitoring,
inventories,
balances

Inspection



Inspection?

- Compliance
- Enforcement
- Feed-back / evaluation
 - ✓ To operators
 - ~~✓ To public~~





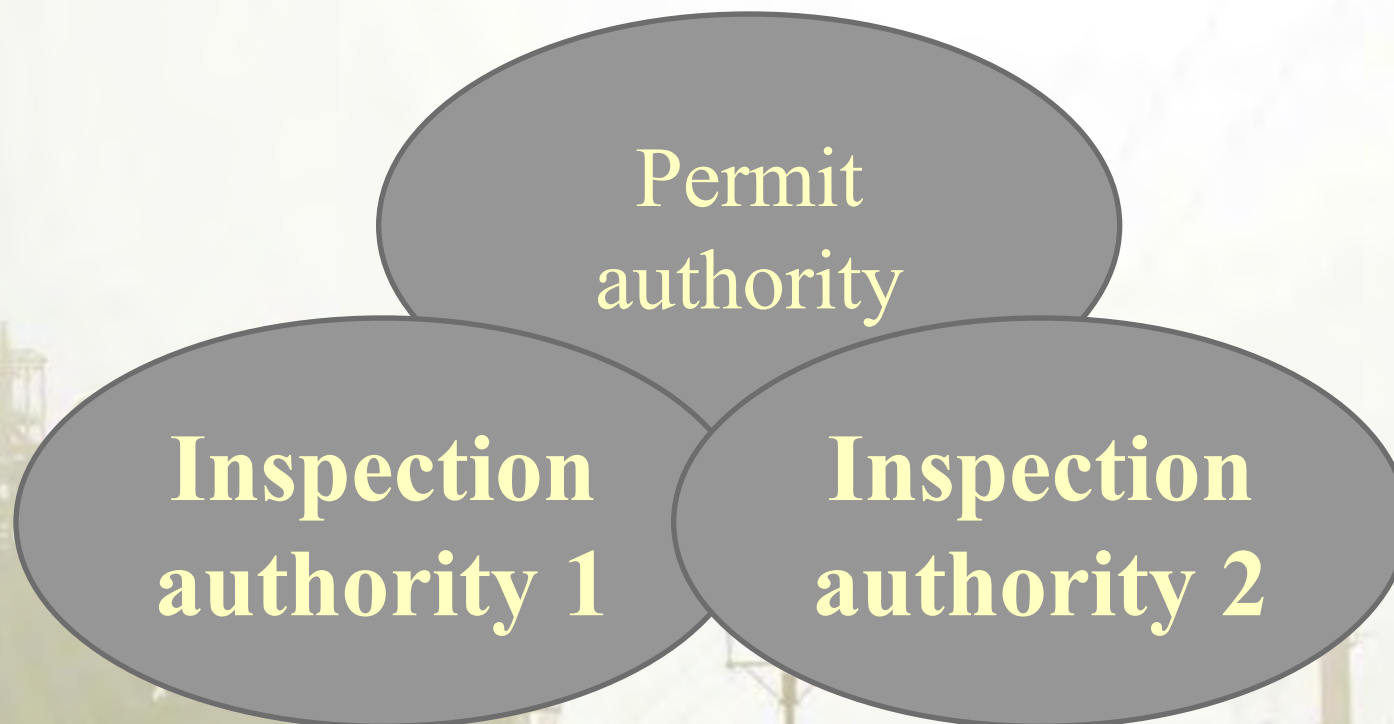
Systematic inspections

- Inspection planning
 - Regularly reviewed and up-dated
 - Installation list
 - Procedure to draw up inspection programmes
 - Procedure for non-routine inspections
 - Provisions for the co-operation of different inspection authorities?



Systematic inspections

- Inspection planning
 - Co-ordination of different inspection authorities?





Sytematic inspections

- Routine inspections
- Non-routine inspections to investigate
 - Serious environmental complaints
 - Serious environmental accidents
 - Incidents and occurences of non-compliance... and before granting, reconsideration or up-date of a permit?!



... and the actual inspection

- Preparation
- Site visit
- Follow up





– Preparation

- ✓ Permit conditions
- ✓ Monitoring data
- ✓ Compliance history
- ✓ Complaint history
- ✓ Key issues, priorities

– Site visit

– Follow up



– Preparation

– Site visit

- ✓ Paperwork = reality?
- ✓ Capacity and throughput
- ✓ Operating condition
- ✓ Emission sources
- ✓ Key equipment and parameters
- ✓ Current projects

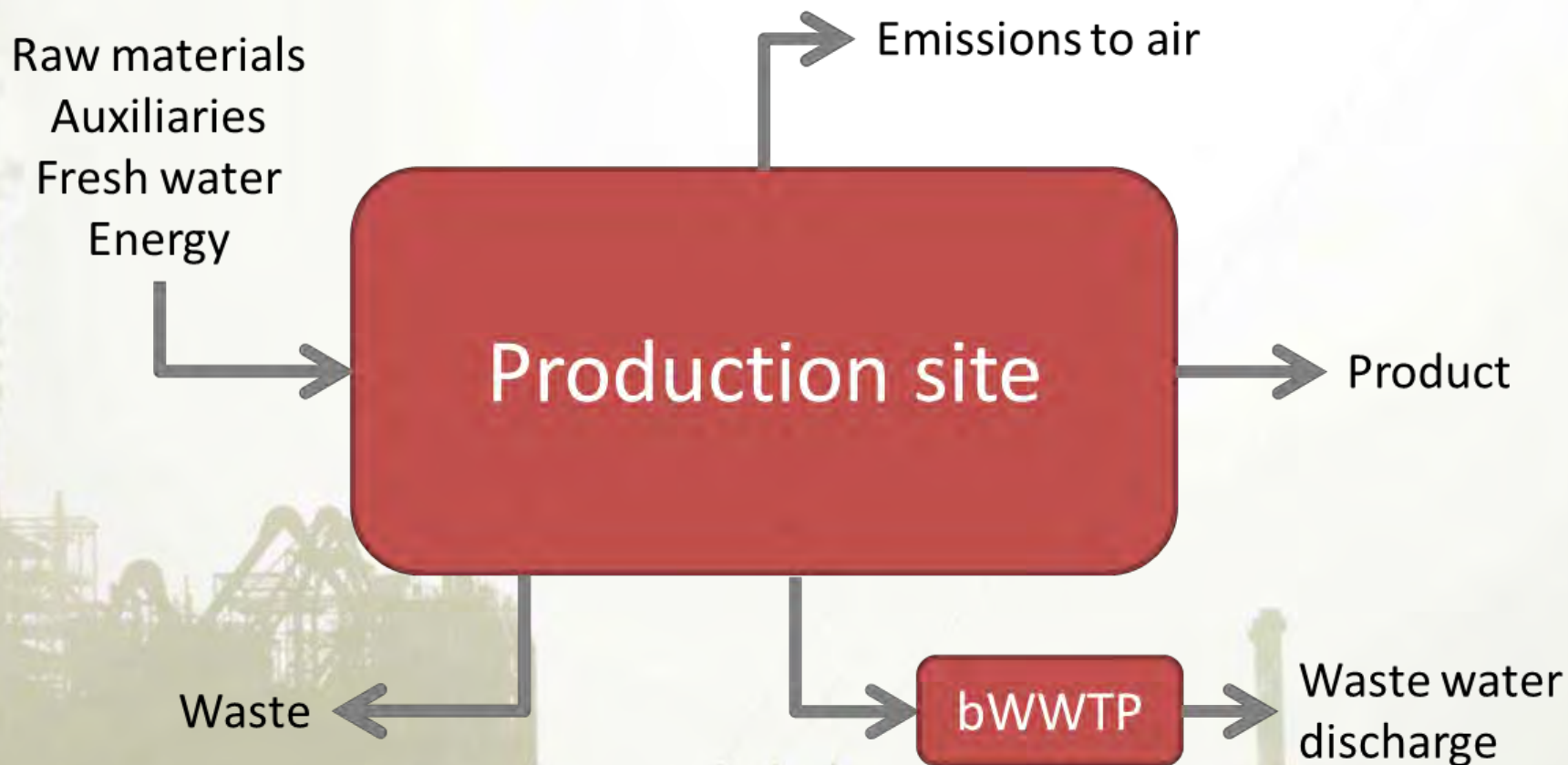
– Follow up



- Preparation
- Site visit
- **Follow up**
 - ✓ Inspection report
 - ✓ Compliance with permit?
 - ✓ Further action necessary?
 - ✓ Notification to operator
 - ~~✓ Publication~~



Integrated approach





Preparation: Inspection on waste water

Monitoring results

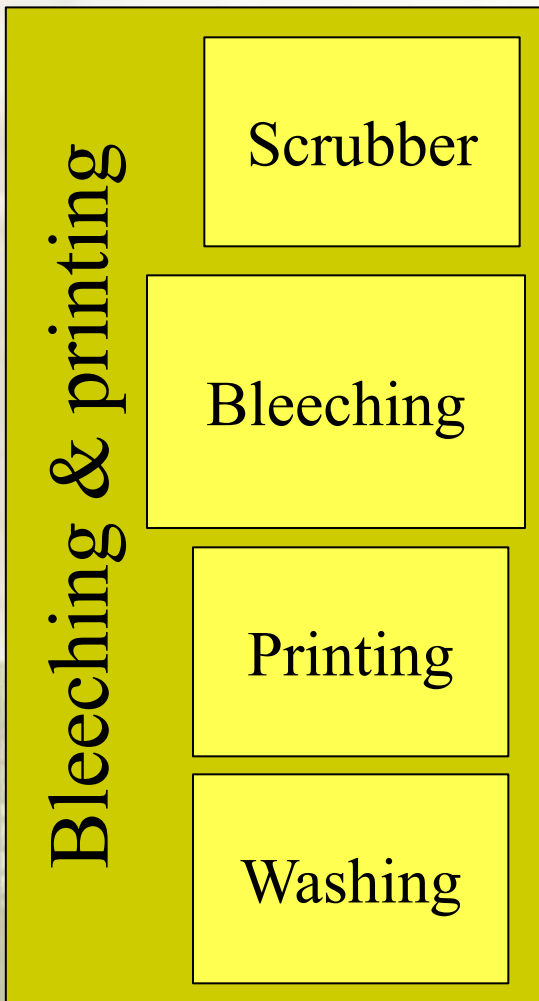
- Yearly
- Monthly
- Daily
- Spot
- Continuous
- Calculated

Permit

- Conditions
- Emission Limit Values
- Sampling points

Production

- Inventories
 - Processes, operations
 - Streams, Stream data
- Balances



Scrubbing liquid?

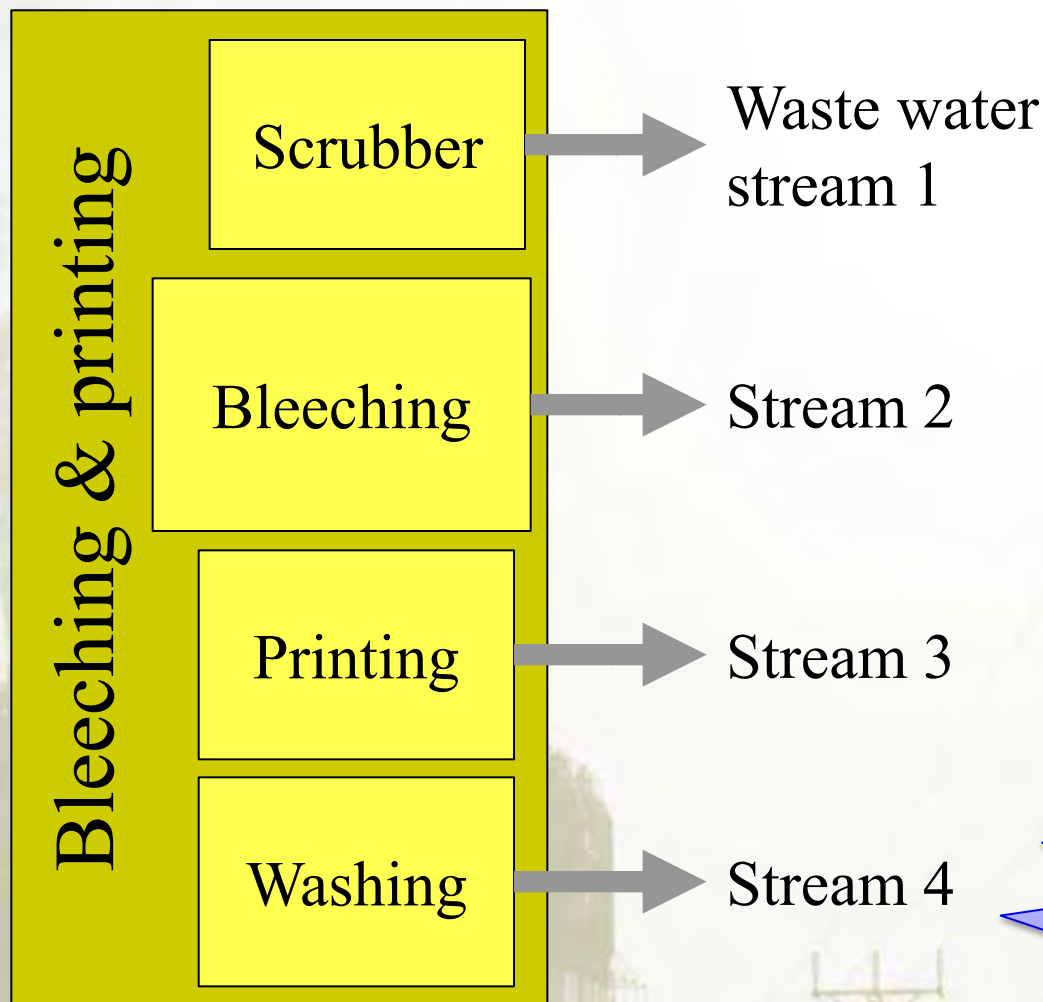
Bleaching agent?

Dyestuffs, auxiliaries?

Surfactants?

Ask and check:
in operation?
current throughput?
process changes?
raw materials?
auxiliaries?
dosing in operation?
spills?
...





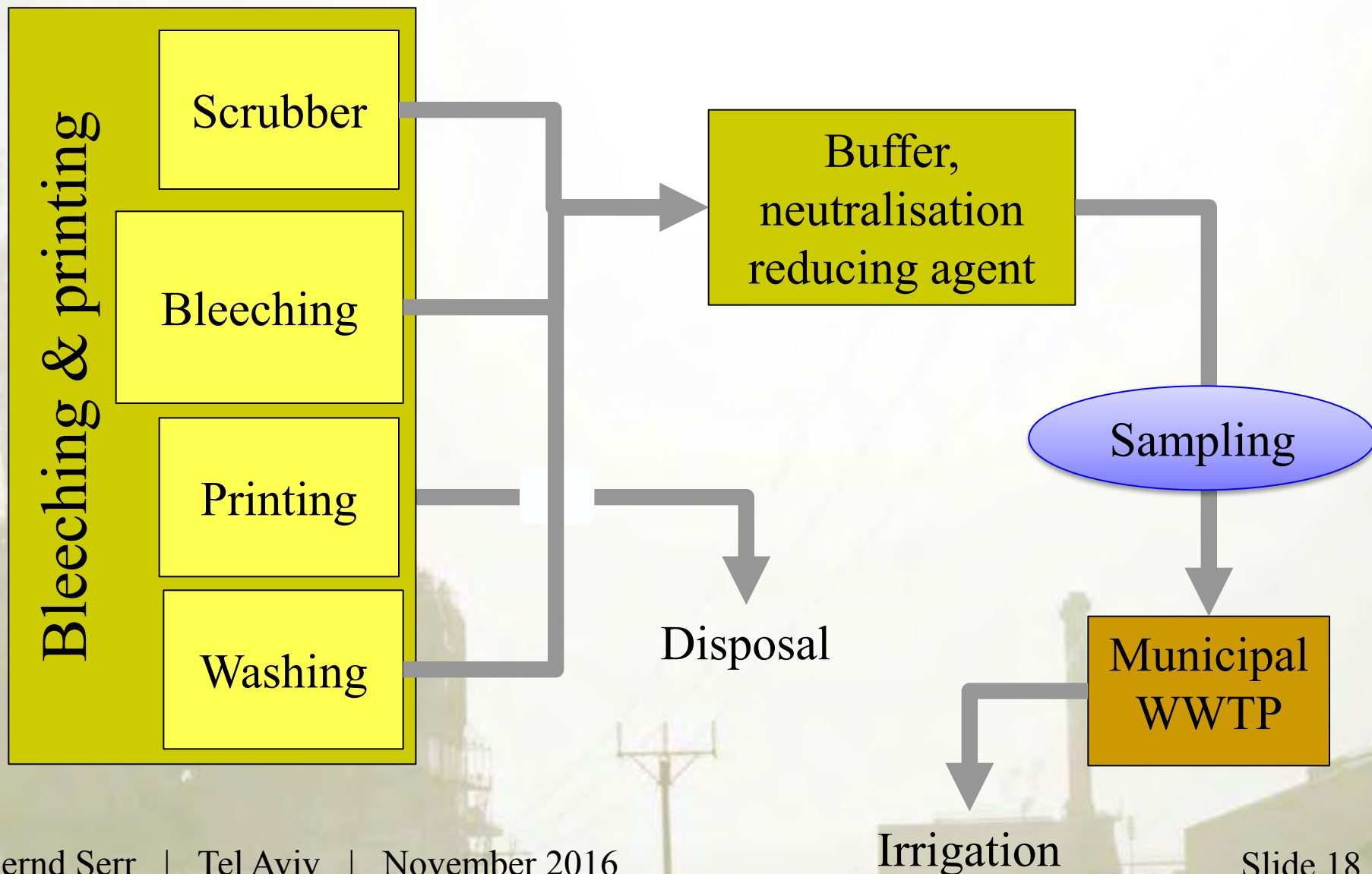
Ask and see:
find the pipe!
stream buffer, tank, drums?
testing?
colour?
odour?

...





Stream inventory & balance					
Stream	m³/day	pH	COD mg/l	Cu mg/l	Going to
1	10	10	--	--	buffer
2	50	3	--	--	buffer
3	0,2	8	very high	very high	disposal
4	40	7	200	0,1	buffer
Total to buffer	100		80	0,04	neutralisation





Ask and see:

dosing? MSR?

sampling?

online measurements?

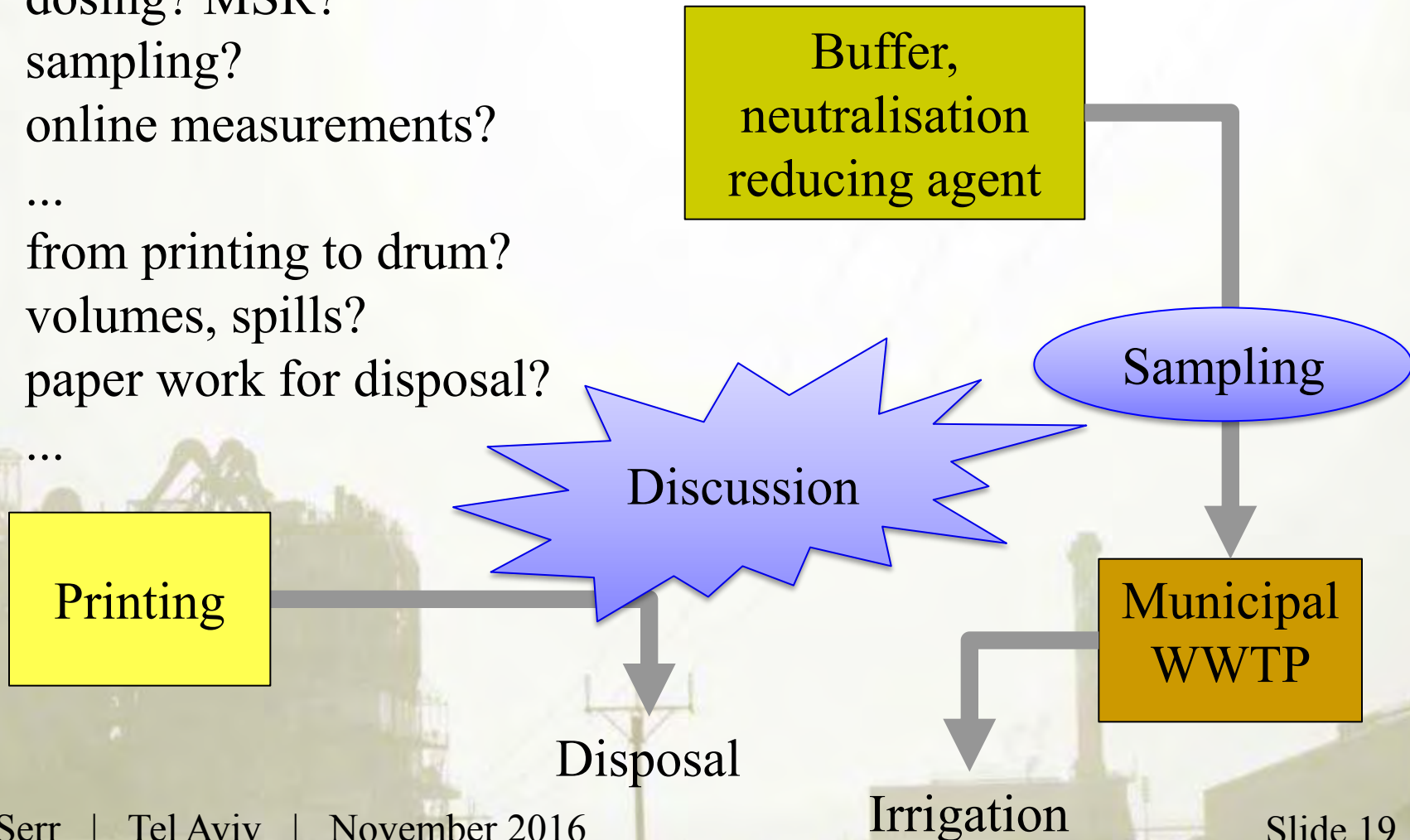
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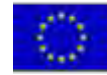
from printing to drum?

volumes, spills?

paper work for disposal?

...





Preparation: Inspection on waste water

Monitoring results

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Permit

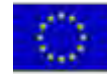
- Conditions
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Stream inventory & balance					
Stream	m ³ /day	pH	COD mg/l	Cu mg/l	Going to
1	10	10	--	--	buffer
2	50	3	--	--	buffer
3	0,2	8	very high	very high	disposal
4	40	7	200	0,1	buffer
Total to buffer	100		80	0,04	neutralisation
Measured Ø	110	6,8	90	0,5	
Current	80	6	190	1,1	plausible?



Preparation: Inspection on waste water

Monitoring results

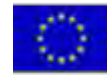
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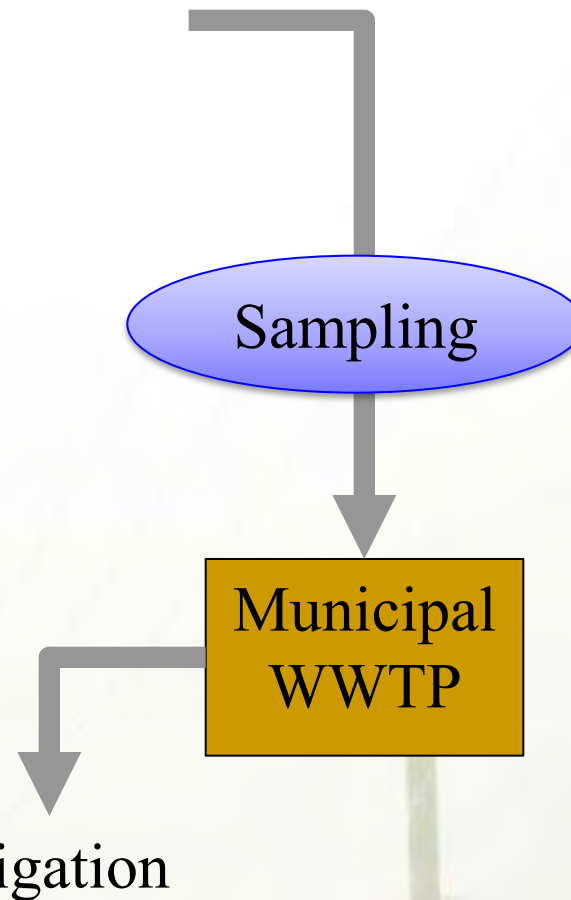
Stream inventory & balance					
Stream	m ³ /day	pH	COD mg/l	Cu mg/l	Going to
1	10	10	--	--	buffer
2	50	3	--	--	buffer
3	0,2	8	very high	very high	disposal
4	40	7	200	0,1	buffer
Total to buffer	100		80	0,04	neutralisation
Measured Ø	110	6,8	90	0,5	
Current	80	6	190	1,1	plausible?
ELV	200	6-9	200	1,0	compliant?



Discussion

Prepare:

- any problems bWWTP?
- Cu in sludge? Levels ok?
- Compliant with ELVs?
- Normal COD levels?
- Volumes?
- Suspended solids?
- Pipes?
- ...





Discussion

Runoff
water

Ask and see:
Measurement?
Sampling?
Maintenance?

Observations:

Dust?

Dirt?

Odour?

Specific to production?

Spills?

...

...

Frequency of alarm?

Volumes?

...

online TOC
pH

Buffer,
neutralisation
reducing agent

Discharge



Bigger, more complex?

- more processes and operations
- more streams
- more relevant parameters
- use more balances
- new: top-lists

no problem, define scope of inspection

Site		Tiberias	
Process location		B4	
Product		Nemo	Product yield 580 kg/year
Waste water stream		Mother liquor 1	Stream ID 160
Batches per day		1	Volume per batch 4000 litres
Batches per year		93	Volume per year 372 m ³
Treatment name		1	
Parameter		Load/batch	
COD		not measured	
BOD₅		not measured	
TOC		14900 mg/l	59,6 kg
AOX		2,5 mg/l	< 0,01 kg
NH₄-N		9,5 mg/l	0,04 kg
NO₃-N		4 mg/l	0,02 kg
Total P		--	--
Heavy metals	Cr	--	--
	Ni	--	--
	Cu	--	--
	Zn	--	--
	Cl	67 mg/l	0,27 kg
	Br	--	--
	SO ₄	69 mg/l	0,28 kg
pH		11,7	
Toxicity		none	
Bioeliminabilty 1		50 %	Zahn-Wellens test 13 days
Bioeliminability 2		59 %	Zahn-Wellens test 28 days
Refractory TOC		7450 mg/l	29,80 kg
Inhibition of nitrification		none	
Result		Readily biodegradable and does not inhibit nitrification	

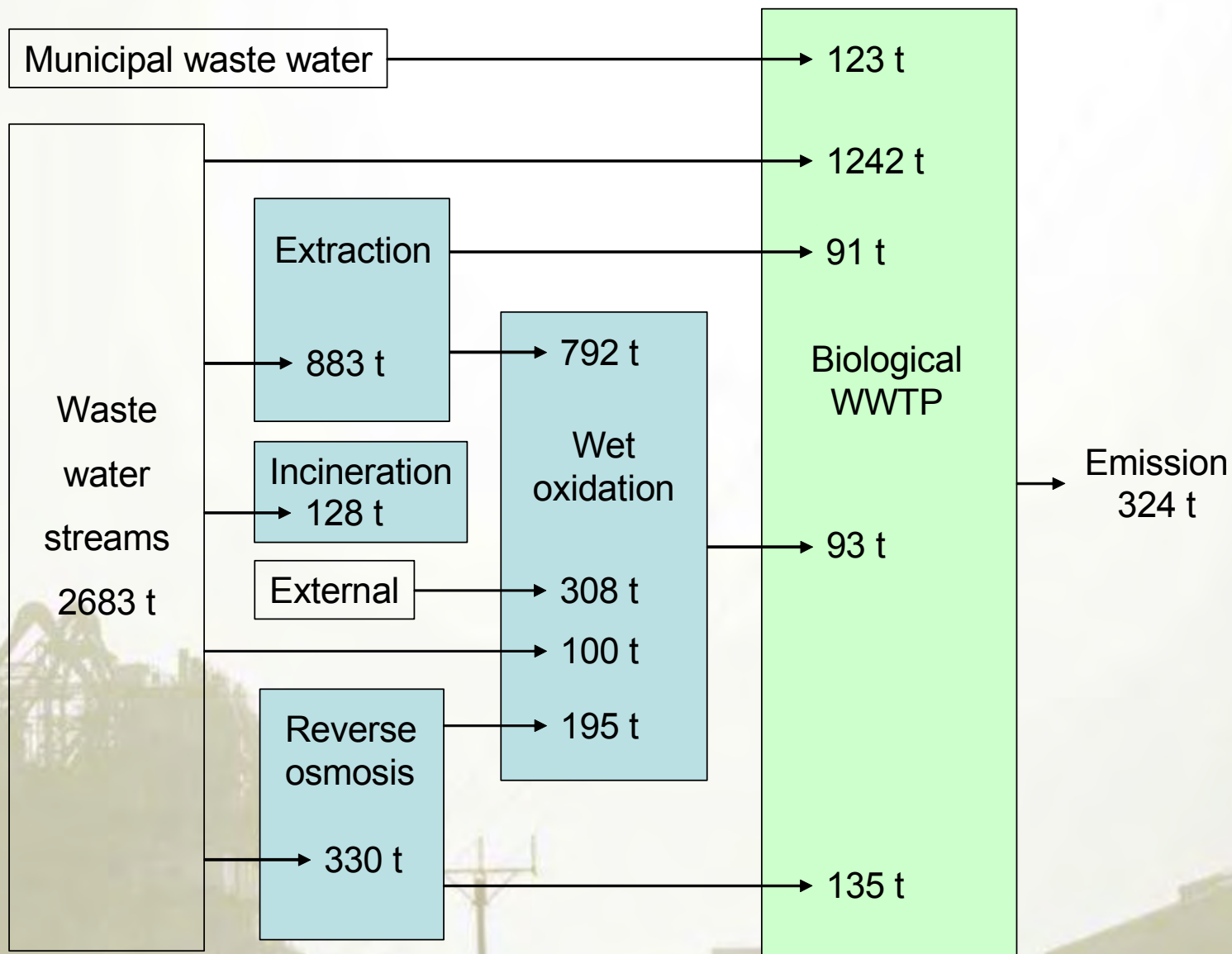


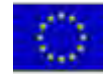
Top-list: e.g. Cr

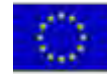
ID	Product	Building	Code	Dest.	Q m ³ /a	kg/a	mg/l	Share %
3485	Actinol v	9044	ML1	Pre	3227	193	60	56%
3495	Ragasaga 5	9100	ML2	Pre	64	17	271	5 %
3498	Ontario blue	9100	WW1	Pre	33	10	320	3 %
3799	Negev dry	A456	WW2	Final	896	9	10	2,7 %
0348	Areon TW	A456	ML1	Final	130	8	60	2,3 %



TOC



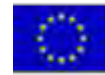




... get the feeling for bWWTP!

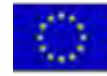
Two example cases:

- **Plant A** with an on-site biological WWTP
- **Plant B** with an off-site joint treatment in a biological WWTP together with municipal waste water
- For comparison: normal municipal biological WWTP
- BATaELs from a BREF



... get the feeling for bWWTP!

BAT	On-site WWTP	Joint municipal	mg/m ³	Normal municipal
12 - 250	390	45	COD	20
BREF OFC	Plant A	Plant B	Yearly Ø	200.000 People



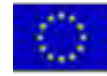
... get the feeling for bWWTP!





... get the feeling for bWWTP!





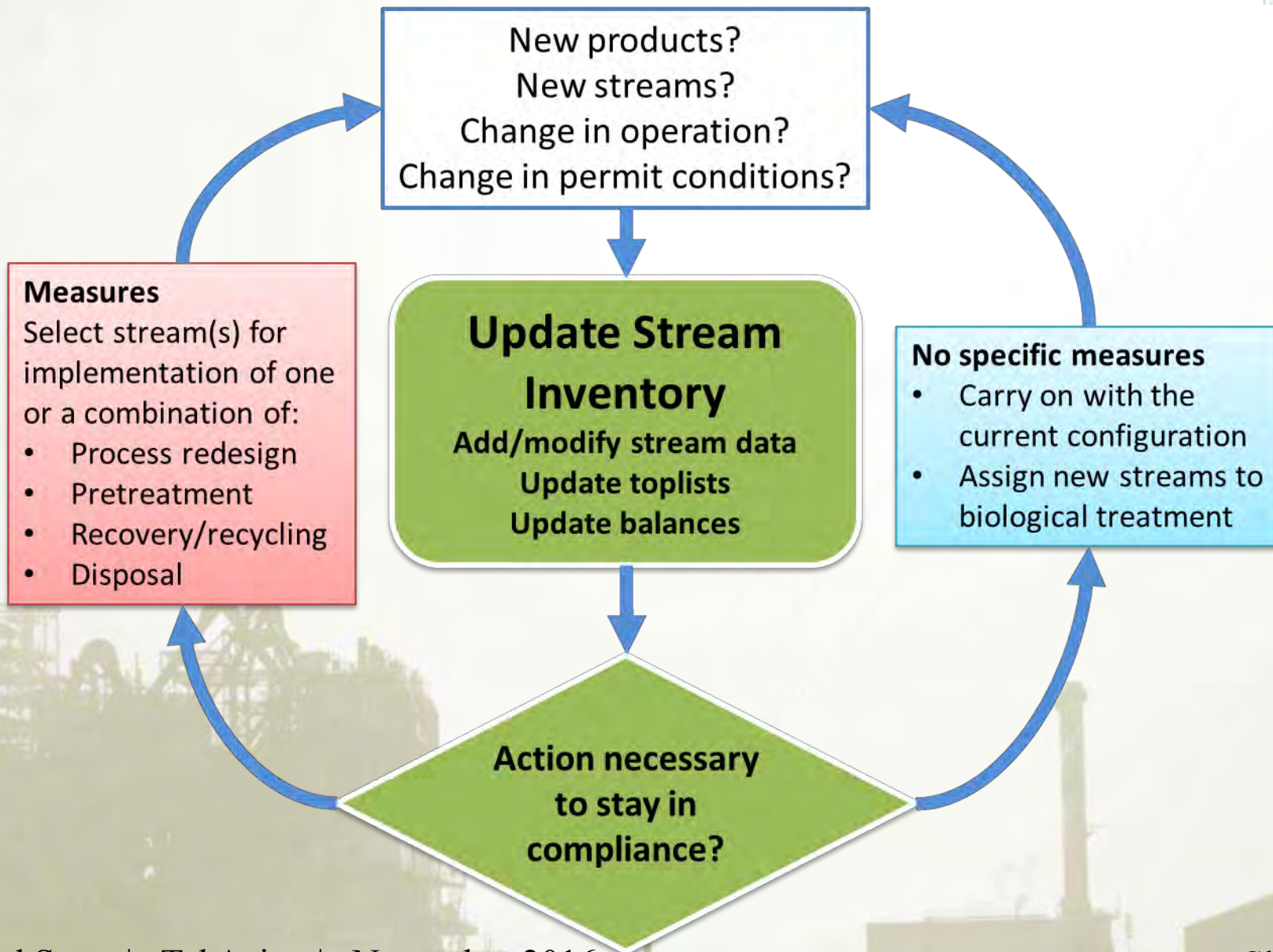
... get the feeling for bWWTP!

COD input:	9000 mg/l (relatively high input level)
COD elimination:	96 % (looks quite good?)
COD emission:	390 mg/l
BOD elimination:	99.6 % (also quite good?).

Streams with very high loads?

Solvents?

Non-degradables?





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